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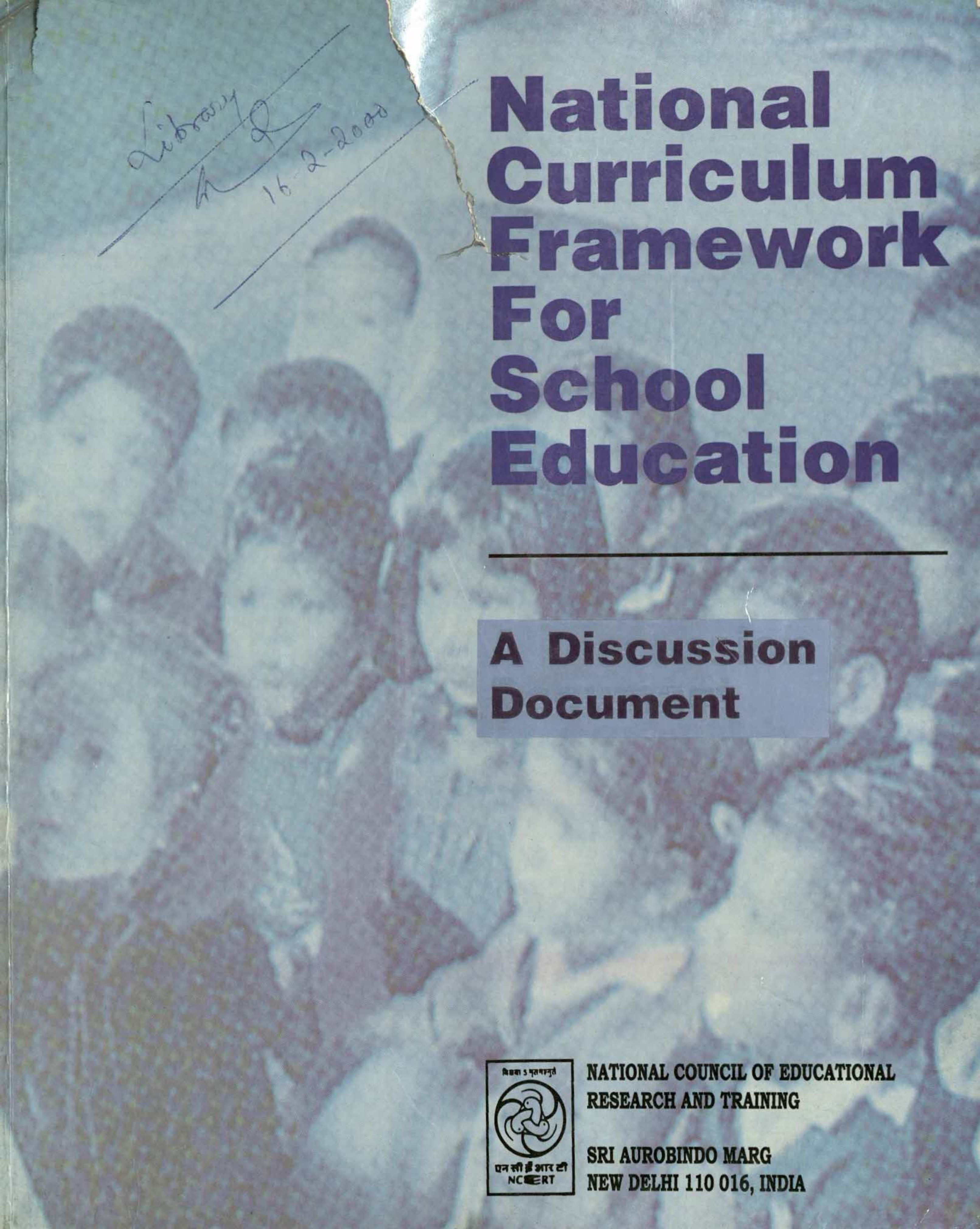

National Curriculum Framework For School Education

A Discussion Document

NATIONAL COUNCIL OF EDUCATIONAL
RESEARCH AND TRAINING

SRI AUROBINDO MARG
NEW DELHI 110 016, INDIA

NATIONAL CURRICULUM FRAMEWORK
FOR
SCHOOL EDUCATION

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NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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PREFACE

MAHATMA GANDHI, writing in the Harijan, in 1947 observed that all education in a country has got to be demonstrably in promotion of the progress of the country in which it is given. This has been realised throughout the world and countries which give priority to education understand the urgency to respond to various kinds of changes that need to be brought into the educational system, content and processes. The *National Policy on Education,* 1986 categorically recommended the revision of the policy and the curriculum after every five years. The National Council of Educational Research and Training also realises that every curriculum has an expiry date and needs to be revised at regular intervals.

The existing document *National Curriculum for Elementary and Secondary Education – A Framework* was developed almost twelve years back in the year 1988. Even though the work on this document had preceded the *National Policy on Education* (NPE), 1986, yet it did respond to and incorporate all the major concerns and issues put forth in the NPE, 1986. It may be worthwhile to point out that this important document came out as a result of hard labour of four long years and has contributed to having a national system of education.

This document has been prepared under rather compelling circumstances. It could not afford the luxury of taking a very long time in its preparation for the obvious reason that it would have further delayed the much needed renewal of syllabi and the new generation of textbooks. It may be made absolutely clear here that as far as some basic philosophy and guidelines are concerned, we are still guided by and also committed to the policy formulations made in the NPE, 1986 and its review in the year 1992, so much so, that at places this draft freely incorporates some of the ideas and their details verbatim from the old Curriculum Document. However, since there was no review made of the *National Curriculum Framework* at any stage after its preparation in the year 1988, the present exercise could not be postponed any longer.

This document is providing a curricular framework for all the stages of school education – Elementary to Senior Secondary, whereas the one developed in the year 1988 had restricted itself to Elementary and Secondary stages alone. The whole idea of including the Senior Secondary stage is to provide continuity and sequence between all the stages of school years and thereby ensure a holistic approach to all the years of school curriculum.

The document has been evolved through a variety of strategies – by looking into theoretical and research materials, consulting practically all the faculty members of the Council, whether at its headquarters in Delhi or at other constituent units, and discussing with them issues that have some bearing on the different aspects of curriculum and its transaction. Eminent educationists and experts were invited to speak to the Curriculum Group and other faculty members. An attempt has been made to integrate all such ideas in the document.

This document shall be taken up for extensive as well as intensive discussions, at both the regional and the national levels to evolve a consensus on an important issue like this. It would be made available to all the stakeholders in education, i.e., other national and state level institutions, Boards of School Education, State Councils of Educational Research and Training, Directorates of Education, Parent-Teacher Associations, Professional Associations of Teachers and Teacher Educators, and Eminent Educationists and Educators. The suggestions/comments received from all these would go a long way to finalise the document.

1 January 2000

J.S. Rajput
Director
National Council of Educational
Research and Training

CONSTITUTION OF INDIA

Chapter IVA

Fundamental Duties of Citizens

ARTICLE 51A

Fundamental Duties – It shall be the duty of every citizen of India —

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

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Curriculum Concerns and Issues

Chapter 1

> *Real education has to draw out the best from the boys and girls to be educated. This can never be done by packing ill-assorted and unwanted information into the heads of the pupils. It becomes a dead weight crushing all originality in them and turning them into mere automata.*
>
> *Mahatma Gandhi (Harijan, 1 December 1933)*

In the Indian way of thinking, a human being is a positive asset and a precious national resource which needs to be cherished, nurtured and developed with tenderness and care coupled with dynamism. Education has historically played this important role and has thereby emerged as a natural characteristic of human societies. It has contributed to the shaping of destinies of societies in all phases of their development and has never itself ceased to develop. It has been the torch bearer of humanity's most noble ideals. In this sense, education, being a subsystem of society, necessarily reflects the main ethos, aspirations and concerns of that society.

It is a fact of history that India had a fairly advanced system of education and the world's first universities were those in India, where they presented a consummate example of education based on philosophy and religion and at the same time stressed the study of mathematics, history, astronomy and even the laws of economics and public administration. The *Chandogya Upanishad* (Chapter II, Sector 1) mentions eighteen different subjects of study including areas such as natural disaster management, mineralogy, linguistics, science of elements, science of defence, etc.

School education is an important segment of the total educational system contributing significantly to the individual as well as national development processes. In order to contribute significantly to these important objectives it needs to be continuously reviewed and updated. In fact, curriculum development which is at the root of this renewal process, has to be seen as a permanent search for qualitative improvement in response to various changes in the society. As we enter the 21st century, it is recognised all over that curricula should be open, active, flexible and intercultural.

The new curriculum framework has to ensure the realisation of the new 'Panchsheel' in the present context which would duly emphasise learner centred education, women centred family, human being centred development, knowledge centred society and innovation centred India.

1.1 CURRICULUM DEVELOPMENT : A HISTORICAL PERSPECTIVE

The overall responsibility of curriculum development – like who should decide what should be taught, and many other related issues were taken care of by the colonial rulers during the pre-independence years. From the perspective of these officials, very little of the knowledge and skills that the native population possessed appeared fit for educational use. As was obvious, the alien rulers permitted no great possibility of including knowledge which related to the country's own ethos, reality, culture and people. The whole idea was that the indigenous knowledge and practices were deficient.

An important aspect of educational development in India during the past few decades has been the continuous and sustained effort to evolve *A National System of Education.* While elaborating about *A National System of Education*, Aurobindo dwelt at length on the nature and power of human mind, nature of simultaneous and successive teaching and training of mental and logical faculty. Writing about his concept of teaching, Aurobindo way back in 1910 pointed out: "The first principle of true teaching is that nothing can be taught. The teacher is not an instructor or task master, he is a helper and a guide. His business is to suggest and not to impose. He does not actually train the pupil's mind, he only shows him how to perfect his instruments of knowledge and helps and encourages him in the process. He does not impart knowledge to him, he shows him how to acquire knowledge for himself..." How prophetic was Aurobindo in the year 1910 !

Gandhiji's *Buniyadi Talim* (Basic Education) as expressed in the Wardha scheme was another indigenous response to the colonial system of education. The curriculum developed under this scheme aimed at the total development of the child, reflecting the Gandhian philosophy of education, i.e. development of Body, Mind and Soul. The failure of this curriculum to emerge as a national curriculum and an alternative to the then alien curriculum, in spite of the fact that it had the full support of the Congress ministries in seven provinces at that time indicated the magnitude and complexity of the problems involved in changing the established structure of education and pattern of curriculum and it posed a challenge to the Indian nation. The challenge has even continued to this day.

The post-independence years ushered in a new era making large scale changes and improvements in school education leading to evolve a national system of education. One of the significant landmarks in the history of Indian education was the appointment of *Secondary Education Commission* (1952-53) and *Education Commission* (1964-66). *The Secondary Education Commission* recommended that the total duration of the school course should be 11 years. One of the pronounced weaknesses of secondary education during the British rule was that it was too academic in character and mostly provided a "single track" which led to the university through the matriculation examination. The Commission, therefore, recommended the establishment of multipurpose schools which would provide terminal courses in technology, commerce, agriculture, fine arts, home science etc. The *Education Commission* took a comprehensive view of the entire system in relation to national development. It viewed education as an integral part of national development. Amongst other things, the *Education Commission* recommended a 10+2+3 pattern of education which was accepted by the Parliament through its Resolution on National Policy on Education in 1968.

An important development in the field of school education during the past more than three decades has been professionalisation of curriculum development, syllabus design and preparation and evaluation of textbooks. The emergence of NCERT and its direct involvement in the process of curriculum development and preparation of textbooks as a nodal agency in this field at the national level gradually led to the establishment of Textbook Boards and the State Councils of Educational Research and Training (SCERTs), State Institutes of Education (SIEs) for providing technical support to research and development activities related to formulation of curriculum and preparation of textbooks at the state/union territory level.

The publication of *Curriculum for the Ten Year School – A Framework* in 1975, and *Higher Secondary Education and its Vocationalization* in 1976 by NCERT gave concrete shape to the efforts for restructuring of school education and adoption of the 10+2 pattern as recommended by the *Education Commission* (1964-66). The publication of these documents was followed by the efforts of the NCERT to develop supporting syllabi and textbooks which were used as models by states and union territories. *Curriculum for the Ten Year School* provided an impetus to the teaching of environmental studies, science and mathematics as part of the general education curriculum from the primary level. The reorientation of science teaching first initiated through the introduction of the new curriculum and activity based instructional materials developed by NCERT gradually developed into a national movement for popularising science among school children.

The *National Curriculum for Elementary and Secondary Education: A Framework* brought out by the National Council of Educational Research and Training (NCERT) in 1988 responded to major thrusts and recommendations highlighted in the *National Policy on Education* (1986) and *Programme of Action* (August, 1986) by incorporating socio-cultural, political and economic considerations as well as by including some important pedagogical concerns. Some of the socio-cultural and economic concerns reflected in the *Framework* were equality of educational opportunity, preservation of cultural heritage, constitutional obligations (of development of a pluralistic open society based on the principles of equality and social justice), strengthening of national identity and unity, character building and inculcation of values, a global perspective (promoting peace and understanding between nations for prosperity of mankind), protection of environment and conservation of natural resources, observance of small family norm.

The pedagogical issues highlighted in the *National Policy on Education* (1986) such as evolving a child centred approach, minimum levels of learning, facilitating creative expression and developing scientific temper as well as developing an interface between education and the world of work were also adequately reflected in the *Framework*. Emphasis was also laid on continuous and comprehensive evaluation as well as on utilisation of media and educational technology. In its totality, the curriculum framework of 1988 has contributed in developing a national system of school education by ensuring levels of uniformity and standards. In addition to this, the realisation of the goals enshrined in the Indian Constitution was one of the major objectives of 1988 curriculum.

As per the *National Curriculum Framework* of 1988 the NCERT developed Guidelines for developing syllabi. Detailed syllabi were also developed for different stages of school education. The State Governments also took steps for development of their curricula, syllabi and instructional materials.

As stated above, the basic features and the main thrusts of the *National Curriculum Framework,* 1988 stem from the policy documents on education (NPE 1968, and 1986). While reviewing the situation with regard to the implementation of these areas, a dismal picture emerges. Of the eleven thrust areas, only a few could be implemented, that too in a limited manner.

The first area was related to the development of human resource from the realisation of the national goals of development. It is general in nature and would be meaningful when the remaining areas get into the system to a reasonable degree.

The second and third areas were related to the nature of school education. A broad-based general education for the elementary and secondary stages along with a common scheme of studies has been accepted by all states and UTs. However, the division of ten years of school into 5+3+2 pattern has not yet been followed by all states. This situation prevails despite the commitment made in the meetings of the Central Advisory Board of Education (CABE) and National Development Council (NDC) in May 1986 and reported in Programme of Action 1986 that "The States where the first ten years are divided into 4 years of primary, 3 years of upper primary and 3 years of high school, will attempt to switch over to 5+3+2 pattern by 1995. Since the duration (8 years) of elementary education comprising 5 years of primary and 3 years of upper primary correspond to the years of free and compulsory education as laid down in the constitution, uniformity in the structure of elementary education would have helped in achieving the target year of universalisation of elementary education of a comparable level. Nevertheless, it is heartening to find that a broad commonality in the scheme of studies and the content of courses has been achieved in the country. It could perhaps be possible because it was implemented vigorously with the support of a regularly monitored centrally sponsored scheme on reorientation of the content and process of education.

The fourth thrust area was concerned with the common core components. A number of alternatives were suggested in the *National Curriculum Framework* document to make these areas an integral part of the core curriculum. One of the suggestions was "...to integrate such content appropriately in the regular subjects included in the present scheme of studies" and generally all states have followed it. It is difficult to quantify the extent to which these areas have been integrated.

The following two thrust areas (V and VI) included defining the Minimum Learning Outcomes (MLOs) for each area of learning at all stages of education and providing flexibility in term of selecting content/components and learning experiences with a view to facilitating the attainment of minimum learning outcomes for each stage of school education. The idea was to shift the emphasis from evaluation (passing judgements) to learning (development in terms of desired objectives). Despite attempts being made to define Minimum Levels of Learning (MLLs) and preparing materials based on these MLLs especially at the primary level, not much success has been achieved as there is lack of clarity among the people concerned, who are involved in the task of transforming these ideas into reality.

With a view to having a comparable standard of school education across the country, the *National Curriculum Framework* emphasised on the establishment of an appropriate machinery such as National Testing Service (NTS). No such machinery has yet been set up. On the contrary, the various kinds of entrance tests for different courses such as medical and engineering, are being held by institutions and states.

In order to facilitate horizontal and vertical mobility of the learners, emphasis was laid on the applicability of the curriculum to all learners irrespective of their modes/channel of learning. Though some efforts have been made in this direction by expanding the distance education and non-formal learning modes, it is difficult to ascertain how effective the curriculum has been especially in term of its applicability. Besides, the pressure on formal system is so high that there is little scope for mobility of learners. There is no worthwhile attempt to provide a curriculum suitable for the groups with special needs.

The most crucial thrust area of providing essential facilities for effective transaction of the curriculum in all schools/non-formal learning centres still appears to be a mirage. Several centrally sponsored schemes, such as "Operation Blackboard" providing science kits, musical instruments etc. have not been too fruitful as one-time support does not create much impact.

In brief, the efforts made so far are not enough for developing a national system of education as envisaged by the policy makers.

Unlike the review of *National Policy on Education* (1986) and *Programme of Action* (1986) in 1992, the *National Curriculum for Elementary and Secondary Education: A Framework* (1988) did not undergo any review since it was published and therefore it became imperative to undertake the present exercise.

Over the last decade, changes in every walk of human endeavour have been much greater in magnitude and impact as compared to the changes of the earlier five or six decades. Educational and social demands have changed. In fact, education and learning have undergone a transformation. India as well as the countries like the USA and the UK have looked critically on the education system and have come out with frank and honest assessment of the situation. *The Challenge of Education* (1985), *A Nation at Risk* (1983) and *Learning to Succeed* (1993) have looked hard at their national systems of education. Within the ambit of systems and structures, curriculum design has an important role to play. It is generally acceptable that in education, curriculum renewal and development is an ongoing process and no nation can afford to go slow in the matter. It must meet the learners' needs, societal expectations, community aspirations and international comparisons.

1.2 CURRICULAR CONCERNS

Curriculum development essentially is a process of a permanent search for qualitative improvement in response to different changes in the society. As such, it is not a static but a dynamic process. A meaningful school curriculum should be responsive to the society, reflecting needs and aspirations of its learners. Even in the new millennium, some of our important societal concerns remain the same for the reason that these could not be met adequately in the past. At the same time there are many new concerns which have emerged in response to the fast changing society. The curriculum should lead to an education that would reduce inequalities and respond to social, cultural and economic contents of the learners and the society and promote excellence. In other words, the curriculum should stand on three pillars – *relevance, equity and excellence.*

Education should be so designed as to meet the complex needs of the individual persons situated as they are in a developing societal context. This would mean designing the content and process of education in a way as to develop requisite knowledge, understandings, skills and attitudes which are in tune with the socio, economic and political ethos of the country and are also responsive to changes and developments taking place in the global context. Some of such imperatives which have bearing on the school curriculum are as follows:

1.2.1 Education for a Cohesive Society

Even after more than five decades of attaining freedom from the foreign rule, we are still striving for a society which is free from various kinds of biases and imbalances such as rural/urban, rich/poor, and differences on count of caste, gender etc. Education can play a very significant role in minimising and overcoming these differences by providing *equality of access to education and opportunity.*

Equality of opportunity for all does not mean nominal equality, the same treatment for everyone. In reality, it means ensuring that every individual receives a suitable education at a pace and through methods adapted to his particular person. Proper care needs to be taken for the children of the poor or those who belong to groups suffering from specific disabilities and social discrimination. These children are in a difficult position from the outset due to lack of care for physical and mental requirements of early childhood or lack of pre-school education. Equal opportunity does not mean levelling. It must not at any cost entail the denial of the fundamental freedom of individuals, or attacks against the integrity of the human being.

To promote equality it is necessary to provide for equal opportunity to all not only in access, but also in the conditions for success. The curriculum, it may be reiterated, should create an awareness of the inherent equality of all with a view to removing prejudices and complexes transmitted through the social environment and the accident of birth. It is here that the curriculum and its transaction will have to take conscious note of the special requirements of the *first generation learners, physically, mentally and visually* challenged pupils as well as pupils coming from the *disadvantaged sections of society.* It is relevant here to make a reference to the recently passed Education for Disability 1995 Act and take a serious note of its provisions for curriculum preparation.

Education of Children with Special Needs

In its theory and practice, curriculum planning offers succinct means of actualising effective integration programmes in schools. Such efforts must identify and organize appropriate instructional objectives, content, materials, methods and evaluating devices for improved teaching experiences to follow the correction of imbalances as perceived by the children. A flexible educational system accommodates wide ranges of students' background and ability in desegregated schools in designing improved learning experiences. The importance of individualising instruction for all special needs children recommends unit concepts as a succinct means to integrate educational experiences. Curriculum planning must interrelate the facets of classroom services, special support services and personnel and cocurricular activities in creating a new and vital programme which will facilitate curricular integration in its most specific applicants.

Children with different disabilities have varied needs which should be addressed, and they should be given an opportunity to have access to curriculum throughout school span and to a differentiated pedagogy. Teacher's efforts should be to develop a relationship and an atmosphere which is conducive to self-motivated, self-actualising, significant learning. Instructional materials need to be produced to create new conditions and to provide vicarious experiences for those who, because of defacto or dejure segregation of schools, are deprived of the opportunity to have direct experiences. There is, in fact a need for empowerment of children with special needs and their parents by building partnerships with them and by involving them in participation at different levels of the process of inclusion, i.e. right from the stage of decision making and planning of evaluation.

Equality in education requires personalised pedagogy, an attentive investigation into individual aptitudes. Compensatory and remedial measures in education to suit the needs of the deprived, the disadvantaged and the challenged, with an idea to bring them at par with other pupils, assume special importance. Access to education of a comparable quality irrespective of gender, caste, creed, location shall have to become an important guiding principle.

Education of Children from Disadvantaged Groups

In order to have a cohesive society there is a need to respond to the education of those groups of children such as Scheduled Tribes, Scheduled Castes and Minorities who have remained deprived of it for a long time. In order to do so there is a need to integrate socio-cultural tribal perspectives and to show concern for their linguistic specificities and pedagogic requirements. Implications of multilingual and multicultural environment shall have to be tackled through specifically devised methodology. Contextualisation of curriculum shall have to be taken care of through textbooks. **The Fundamental Rights of minorities and people coming from various disadvantaged groups like Scheduled Castes, Scheduled Tribes and other backward communities have to be consciously incorporated in the curriculum.** Even the problem of educating migrating population shall have to be tackled through specific condensed educational programmes based on the basic ingredients of the national curriculum.

Education of the Girl Child

Equality between sexes is a fundamental right under the Constitution of India. The State also has the right to practise protective discrimination in favour of disadvantaged population groups including women. In education we have moved from Equality of Educational opportunity (NPE, 1968) to Education for Women's Equality and Empowerment(1986). As a result of this change, curricular and training strategies for the education of the girl child have emerged as a strong contender for attention. Besides increasing access of girls to education, especially rural girls, there is equally a greater need that gender discrimination and gender bias in school curriculum, textbooks and its transaction are eliminated. There is a need to develop and implement gender inclusive, gender sensitive curricular strategies to bring up a generation of girls and boys who are equally competent and are sensitive to one another, and grow up in a caring and sharing mode as equals, and not as adversaries.

Education can also help to achieve social cohesion by preparing pupils for 'learning to live together', a concept which in the Indian tradition has been hailed as *Sehhridya Sarvabhutanam.* Internationally, the idea of 'learning to live together' has been forcefully put forward in Delors Commission'*s*, *Learning: The Treasure Within.* Learning to live together requires to ensure that social conditions, prejudices within the society and the community are dealt with utmost sensitivity and with understanding.

1.2.2 Strengthening National Identity and Preserving Cultural Heritage

The school curriculum must inculcate and maintain a sense of pride in being an Indian through a conscious understanding of the growth of Indian civilisation and also contributions of India to the world civilisations in its thoughts, actions and deeds. Strengthening of national identity and unity is intimately associated with the study of cultural heritage of India. It is here that education has to play its dual role of being conservative and dynamic – bringing about a fine synthesis between change-oriented technologies and the country's continuity of cultural tradition. While on the one hand, education should help in promoting a global world order, on the other, it should be seen as developing a national consciousness, a national spirit and national unity which are considered essential for national identity. At no point of time can the school curriculum ignore including specific content which nurtures national identity, a profound sense of patriotism, non-sectarian attitudes, capacity for tolerating differences arising out of caste, religion, ideology, region, language, sex, etc. It is also important to incorporate India's contribution to world culture and technology in our school textbooks so as to promote awareness among Indian students about the rich cultural and scientific heritage of the country. It becomes desirable to do so since many children are not aware of the progress and achievement of the country in the field of science and technology.

It may be reiterated that the national spirit and national identity assumed great importance during long saga of our freedom struggle. As such, the study of India's freedom struggle by pupils at all stages of school education shall continue to be significant in this context. However, conscious care shall have to be taken to acquaint pupils with the events related to freedom struggle and with the sacrifices made by the people in different parts of the country – from North to South, West to East, as well as including regions such as the North-East.

1.2.3 Integrating Indigenous Knowledge and India's Contribution to Mankind

Education in general, and the process of curriculum development in particular, in many of those developing countries which not long ago were part of the colonial rule, even now continue to be strongly influenced by the vestiges of the past. In practical terms it means copying enmass the ideas generated in the western countries and then their blind application in entirely different contexts. Education in order to be relevant and meaningful should relate to the socio-cultural context of the pupil. An indigenous curriculum would celebrate the ideas of native thinkers such as Aurobindo, Gandhi, Tagore and Krishnamurthy to name a few of them. It would also rest on innovative experiments and experiences which have emanated from its own context. Against this background it may also be pointed out that there is a need to bring to notice the contribution of India to the world wisdom. Paradoxical as it may sound, while our children know about Newton they do not know about our own Aryabhat, they do know about a computer but do not know about the concept of zero. Mention may also have to be made for instance of Yoga and Yogic practices as well as Indian systems of medicines like Ayurvedic and Unani forms which are being recognised and practised all over the world. The curriculum shall have to correct such imbalances.

Today there is world-wide recognition of the indigenous knowledge system. This is for an instance, especially so among the environmentally concerned people because it is difficult to ignore the fact that they have proved to be environment friendly in thousands of years of human existence. Indigenousness, however, is not opposed to being receptive to new ideas from different cultures and cultural contexts. Indigenousness, to make it clear, is as opposed to the narrow nationalism as to the false universalism.

1.2.4 Responding to the impact of Globalisation

At the dawn of the 21st Century many unprecedented challenges await us. One of these is the phenomenon of globalisation resulting in large part from the world-wide integration of the economic and financial sectors. Globalisation is an outcome of rapid and significant technological changes, geo-political evolution, and a dominant ideology of regulation by the market. As a result of globalisation, most of the problems do not stop at any one country's border posts, but call for world-wide solutions. In this sense we are now truly members of a global village or in the old Indian tradition recommitting ourselves truly to the idea of *Vasudhaiva Kutumbakam* (the whole world is my family).

The main implications of the phenomenon of globalisation would be emergence of learning societies due to the multiplication of sources of information and communication, transformation of the nature of work requiring more flexibility, necessity of team work and use of new technologies. The challenges raised by globalisation for educational processes would mean rethinking about the delivery of educational content, integrating new sources of information, developing competence alongwith knowledge and also to adapt curricula to the needs of the different socio-cultural groups, and to maintain the national and social cohesion of the country. In the context of globalisation as well the principle of 'learning to live together' and ways and means to develop it assume great significance.

Responding to the phenomenon of globalisation would lead us to rethink defining new scope for old disciplines such as history, geography, foreign languages etc., introducing new curricular concerns such as education towards active citizenship and human rights, environmental issues and promoting consensus on a common core of universal values.

1.2.5 Meeting the Challenge of Information and Communication Technologies

The revolution in new technologies constitutes a fundamental challenge, converting the information society into a knowledge society. Information and Communication Technologies (ICT) can be summarised as the convergence of telecommunications, television and computers. The new technologies have tremendous potential to revolutionise education, dramatically transforming schools. It is hoped that the monopoly of the formal education and the formal school will diminish, with a lot of educational exposure and experiences being gained outside these institutions. The ICT is bound to influence and transform existing educational provisions, influencing globalisation of education, changing the existing curricula, bringing in new generation learning materials and encouraging networking of schools.

Integration of ICT into schooling would have several other implications which make a clear demand that the educational planners shall have to look beyond the current classrooms devising updated plans for education in an electronic environment and expanding their design so that the computer becomes more than a subject of study or is merely integrated into an existing curriculum – it becomes, instead, an integral part of the schooling process. All innovative experiments in the areas of media production, interactive video and multimedia computer software shall have to be perceived as integral component of curriculum development processes, rather than external to it. It would necessitate that the teachers adopt an instructional design that helps the learner master heuristic and algorithmic strategies for tackling new problems as opposed to strategies which aim at mastery of discrete units of fixed knowledge. It is not only the teachers teaching style which would be influenced by the ICT but it would have its impact on the learning style of pupils whereby there would be a shift from: traditional learning atmosphere to a climate of values that encourages exploration, problem-solving and decision-making; didactic classroom teaching to participatory, decentralised, interactive group learning; traditional instructional methodology to strategies that unify knowledge; mastery of fixed body of knowledge to understanding of a web of relations between parts of a whole; linear sequential reasoning to search for patterns and connections and collection of information to processing of information.

It is, therefore, evident that traditional tests cannot measure the skills and abilities that result from this shift.

It is only with new skills and perceptions that the teacher can assume his/her new role as a facilitator of learning and implement and maintain innovations in the classroom. This calls for a new definition of pre-service courses and effective training and orientation programmes for those who are already in the job.

1.2.6 Linking Education with Life-Skills

Education, by and large, suffers basically from the gap between its content and the living experience of its pupils. Education in its real sense should prepare pupils to face the multifarious challenges that they are bound to face in the society. In order to do so, education needs to be intimately linked with different life-skills. Life skills are abilities for adaptive and positive behaviour that enable individual to deal effectively with the demands and challenges of everyday life, by developing in them generic skills related to wide variety of areas such as health and social needs. It is through these skills that pupils can fight the challenges of drug violence, teenage pregnancy, AIDS and many other health related problems. Knowledge and proficiency in these skills for an instance, would also make pupil aware of issues such as consumer rights, questioning the quality of goods and services that are available to them, writing to the manufactures, public utilities and civic authorities on the quality of goods and services that they expect.

An important characteristic of life skills is that they are temporal and spatial in nature, therefore, they are required to be contextual. There are certain core life skills such as problem solving, critical thinking, communication, self awareness, coping with stress, decision making, creative thinking, interpersonal relationships and empathy which are of critical importance for a successful living.

1.2.7 Education for Value Development

The growing concern over the erosion of essential values and an increasing cynicism in society has brought to focus the need for readjustments in the curriculum in order to make education a forceful tool for the cultivation of social and moral values. In our culturally plural society, education should foster universal and eternal values, oriented towards the unity and integration of our people. Such value education should help eliminate obscurantism, religious fanaticism, violence, superstition and fatalism. Apart from this combative role, value education has a profound positive content, based on our heritage, national goals, and universal perceptions. It should lay primary emphasis on this aspect.

The National Policy on Education (1986) has also stressed on equity and social justice in education. The main focus has to be on evolving a system of education to promote India's unique socio-cultural identity. It has to contribute to national cohesion, promoting tolerance, scientific temper and concerns enshrined in our constitution. The recommendation of the Justice Verma Committee on Fundamental Duties of Citizens may pave a way for strong commitment to human values and social justice. This implies that the content and process of education is to be reoriented for social cohesion and emerging national system of education. Value education, therefore, has to be given a prominent place in the system.

As a part of national system of education we recommit ourselves to the core components which were mentioned in the *National Curricular Framework* (1988) which were: the history of India's freedom movement, constitutional obligation, content essential to nurture national identity, India's common cultural heritage, egalitarianism, democracy, secularism, equality of sexes, protection of environment, removal of social barriers, observance of the small family norms and Inculcation of the scientific temper. The curricular task would remain incomplete if ten duties that have been enshrined in our Constitution and exposure to this Constitution Amendment 51A does not become a part of textbooks at appropriate places. Ten duties given in the Constitution are: to abide by the Constitution and respect its ideals and institutions, the *National Flag* and the *National Anthem;* to cherish and follow the noble ideals which inspired our national struggle for freedom; to uphold and protect the sovereignty, unity and integrity of India; to defend the country and render national service when called upon to do so; to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women; to value and preserve the rich heritage of our composite culture; to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures; to develop the scientific temper, humanism and the spirit of inquiry and reform; to safeguard public property and to abjure violence and to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

During the year 1988 the general objectives of education were designed to enable the learner to acquire knowledge to develop concepts and inculcate values commensurate with the social, cultural, economic and environmental realities at national and international level. The school curriculum was, therefore, designed to promote qualities that make a man socially effective and happy, and also inculcate friendliness, cooperativeness, compassion, self-discipline, self-criticism, humour, courage, love for social justice, self-control, etc. The curriculum should also emphasise the development of moral and character values such as honesty, truthfulness, dependability, courtesy, fearlessness, compassion, tolerance, etc., In order to promote scientific temper, the knowledge of scientific methods of enquiry and their use in solving problem may be emphasised. Efforts through curriculum may be made to develop capability of appreciating and tolerating differences and diversities of various sorts and the capacity to choose between alternative value systems.

The curriculum in schools should attempt at development of non-cognitive areas of learning with emphasis on key qualities for personal and social growth of children. The key qualities are: regularity and punctuality, cleanliness, industriousness/dilligence, sense of duty and service, equality, cooperation, sense of responsibility, truthfulness and national identity.

The futuristic perspective should relate to development of the desirable core of universal values such as value of social equality and democratic participation in decision making, understanding and tolerance of cultural differences and pluralism, spirit of caring, cooperation, enterprise, creativity, sensitivity to gender equality, open-mindedness, and sense of obligation to environment protection and sustainable development.

1.2.8 Non-Formal / Alternative Schooling

Towards the goal of achieving universalisation of elementary education(UEE), the role of non-formal education is important. Alternate schooling is a broader term that includes non-formal education, open education, distant education, and other flexi systems run by government agencies and non-government organisations (NGOs).

Non-Formal Education focuses on pupils in the age-group 9-14 years, who can either not join regular schooling or drop out prematurely. Although a substantial progress has been made during past decades in this direction by opening of non-formal centres, for a country like ours, a great amount of effort is required to achieve our targeted goal of UEE. Mere increase in enrolment of students is not enough. Retaining these students in the system and providing them meaningful learning experiences are much more crucial. In a resource-crunch country where there is not enough funds available for the formal schooling, providing funds for the NFE Centres is a difficult yet challenging task.

Majority of the non-formal centres are for primary education. Remaining are for the upper primary stage. Upgradation of schools upto the upper primary stage and maintaining a minimum level of quality of education being imparted at these centres may help to spread the fruits of literacy to a larger group of children.

1.2.9 Integrating Diverse Curricular Concerns

Curriculum development process is often influenced more by a 'panic approach' in which local, national or international developments which have a socio-economic and political bearing influence decisions to be made to change the curriculum without prior, careful and structured planning. It has been experienced that the 'panic' approach of including new and emerging curricular concern may sometimes lead to an overloading of the curriculum increasing the difficulty of teachers' task. It may be advisable when faced with such issues to carefully examine what is already present in the curriculum that may be of relevance, and how to effectively incorporate new issues. There is often a tendency and clamouring for including such new concerns as separate areas of knowledge. At a time when concerns such as 'environmental education', 'consumer education', 'tourism education', 'AIDs education', 'human rights education', 'peace education', 'population education', and 'global education', are making a case either for their entry or for separate place in the school curriculum, the best approach would be integrate these ideas and concepts, after a careful analysis, in the existing areas of knowledge.

It is thus vital to examine the learning opportunities available when designing new curricula or introducing specific changes so as to avoid a disparity between expectation and reality.

1.2.10 Relating Education to World of Work

Work education and vocational education are an integral component of our school education system. There has been varying degree of success achieved in these areas. The present policy relating to work experience, as a purposeful, meaningful manual activity can continue to remain as a part of primary stage curriculum. Work experience is a thoughtful strategy to develop understanding of facts and principles involved in various forms of work and to develop positive attitude towards work. At the primary level children can be involved in observation of work situations, participation in it and also production and preparation of few articles by them. At the upper primary stage the continuation of work education would again reinforce respect for meaningful work. Looking to the nature and level of pupils at the secondary stage, the activities at this stage should become comparatively wider. The work education activities should prepare students mentally to take up vocational stream at the +2 level. In its final analysis the whole intent of work experience is viewed as purposive and meaningful manual work, organised as an integral part of the learning process.

Efforts and initiatives in vocational education during the last decade have opened up ample learning opportunities some of which are critical to future perceptions and planning. The social and community acceptability of vocational stream has gradually risen though not at the desired pace. In fact the success has been evident only in those areas where initial exercise of planning and identifying the vocations was conducted on professional and sound understanding. In order to ensure success, attention shall have to be paid to local situations which play a major role.

The scope and focus of vocational education must extend itself beyond the organised sector of employment potentialities which is very low. Its model must accommodate the aspirations of the entire population. This alone would lead to a better educational transformation and provide avenues of development of human potentialities which cannot be narrowed down to meet the organised industrial sector alone. The focus has to be on the vast unorganised sector of self-employment. In order to ensure greater participation in the vocational stream of education, there is a need for incorporating sound components of work education in the process of education at the secondary stage, interspersed throughout the ten years of schooling. Viewed in its totality, this alone would lead to development of manpower for a variety of activities.

The vocational or pre-vocational curriculum can lend itself to the possibility of organising concrete opportunities for students to collaborate for the good of the group, the class in general, the school or the wider community. Many skills can be taught through services which benefit the community as a whole, bringing the school chosen to its environs and helping pupils to become aware of their commitments to school and community. Cooperative activities can promote friendships, communal harmony and empathy for others.

All vocational education programmes and activities should stress the concept of sustainable development with a focus on fostering awareness of key environmental concerns and the rights of all to a decent standard of living.

1.2.11 Reducing the Curriculum Load

It is a long standing concern that the school going children have to suffer from, both the physical as well as mental load of the Curriculum. There is in fact tremendous pressure from parents and community that school curricula has become very heavy. The heavy load of curricula have been responsible for developing tremendous amount of stress and strain amongst students and thereby affecting their normal development. Steps in the recent past were taken to look into this problem and advise on the ways and means to reduce the load on school students at all levels, particularly the young students. In spite of the fact that many measures to reduce the problem of load were suggested, the reality remains that the school curricula continue to suffer from this acute problem. This is now, perhaps, the opportune time to squarely address this problem.

The problem of curriculum load is a very complex one, which has its roots in many related issues. The problem cannot be wished away merely by downsizing the volume of the textbooks but has to be perceived in its totality. One way to partly resolve the issue would be by taking out information which has become obsolete and thereby redundant. The problem of load, to a great extent, is also because of undue emphasis on memorisation of large number of facts. This in its turn influences the way pupils are tested and also taught. In order to break this vicious circle there has to be a shift from 'content' to the 'processes' of learning. Teaching shall have to be geared to make pupils 'learn how to learn'. This in itself has implications for both – pre-service as well as in-service teacher preparation. The problem of curriculum load shall continue to persist unless it is looked in a holistic manner.

1.2.12 Child as a Constructor of his knowledge

It is an indisputable fact that the children grow up in their own social worlds. As such education whether pursued by them in the formal institutional settings or otherwise includes to a great extent social activity to transmit a social selection of knowledge. As opposed to epistemic models of the child which does not provide a great scope for the child's social experiences, the constructivist movement in recent years has reemphasised the active role students play in acquiring knowledge and the social construction of knowledge has been an important principle in socio-cultural theory. What does it mean to construct one's own knowledge? Acquisition of knowledge through active involvement with content and not imitation or memorisation of material are at the root of construction of knowledge. In the constructivist setting the students have autonomy for their own learning, opportunities for peer collaboration and support, occasions for learner generated problems that drive the curriculum, time for self observation and evaluation and outlets for reflection. Autonomy encourages students to construct their own knowledge and gain new perspectives through hands on experiences rather than follow prescribed information. This perspective recognises the role of teacher as primarily a facilitator of learning. Rather than dictating what should be done, the facilitative teacher tends to act as a guide, providing the resources for the learner and enabling the latter to decide how to learn and what to learn.

1.2.13 Recognising Interface between Cognition and Emotion

In the recent years their has been increasing emphasis that education should facilitate personal growth of the learner and psychologically equip them to cope with rapid changes taking place in all spheres of life: socio-cultural vocational worlds. Thus, the focus of education is moving away from providing cognitive skills (traditional 3Rs) to fostering inter-personal and interpersonal development. Educators are realising that besides academic deficiencies there is a different and more alarming deficiency: Emotional illiteracy. The components of emotional intelligence (or literacy) include emotional and social skills, which relate to the education of moral development and also have implications in management and prevention of anger, aggression, truancy, alcohol/drug dependency, sexual abuse, solving interpersonal conflicts etc. Education for promoting emotions need to be recognised as an essential element of the educational process in the classroom since emotion provide information, direct attention, and facilitate the attainment of goals. Infact for the teacher emotions can become a valuable tool for education of various reactions.

It has been shown that 'emotional literacy' programmes directly alter the level of success, self-esteem and well-being of a person. They help reverse a tide of educational decline and thus strengthen schools. Nurturance of Emotional Intelligence, therefore, becomes a prime concern for schools and curriculum makers.

Curriculum should also focus on providing learning experiences which help describe individuals thought and feeling. Multiple Intelligences (MI) take into consideration that every individual is an unique person and this uniqueness influences the various ways in which learning take place. An idea like this which does not look at intelligence as an unitary concept but as a multiple attribute, promotes personalisation of education by connecting the learner's total life to the learning in the classroom.

Multiple Intelligence approach offers the learner many opportunities to explore significant concepts and topics on their own, to think about a topic on their own in many ways, and to have many ways to make sense of what they find. Use of Multiple Intelligence in the curriculum provides for a variety of experiences that become the entry points into the lesson content and reach the learners in ways they can understand.

Multiple Intelligence education provides a framework that helps curriculum planning and also teachers to look for the differing strengths of the learners, and develop the full range of their intelligence's. As it provides for a variety of experiences it offers more number of students the opportunity to succeed.

1.2.14 Using Culture-Specific Pedagogies

India is a multicultural, multilingual and multireligious society. Every region and state has its typical identity. This would have implications for pedagogical approaches to be followed in different context. Internationally, pedagogy is perceived not merely as a science of instruction but as a culture or as a set of sub-cultures which reflect different contexts and different teaching behaviours – inside and outside classrooms. The plural nature of Indian society needs to be reflected in the pedagogical approaches. Since there is no one universal way in which the children learn, there is a strong need for looking into the cultural context in which a child is placed. A child in a tribal society may process information in an altogether different manner as compared to the one from the urban areas and high socio-economic stratum. Pedagogy, therefore, should be culture specific. Instead of using one uniform, mechanistic way of student learning, cultural practices such as story-telling, dramatics, puppetry, folk-play, community living, etc. should become a strong basis of pedagogy. Cultural specificity should get embedded in the pedagogical practices which should be evolved for tribal, rural, urban and other ethnic groups and communities.

1.2.15 Education and Development of Aesthetic Sensibilities

There is a need to shift from traditionally oriented, cognitively focussed approach of education to a more holistic education which places learning within the context of learner's total experience rather than as only a part of experience. Aesthetic approach to education strives to restore an appropriate balance to the learning process by giving equal status to experience, imagination, creativity and intuition, as it does to knowing, thinking, remembering and reasoning. Aesthetic approach to curriculum would provide the means for activation of senses for new insights and understanding of the learner.

Aesthetic experience is potential in any area in which the individual interacts with the environment solving of an algorithm, creation of sculpture, planting of a garden – all can be sources of aesthetic experience. Since such experiences are emotionally complete, coherent and provide intrinsic satisfactions, it increases the likelihood of individuals' inclination towards subjects/sources through which they have been secured. Subject matters or disciplines when addressed with aesthetic considerations have in common the features of cognition; sensitivity to composition, attention to nuance, the need for flexible purposing, the exercise of imagination. Aesthetic education refers to developing students ability to have such experience and therefore the concern of curriculum.

1.2.16 Continuous and Comprehensive Evaluation

Curriculum has to respond to the learning needs of the students, which are usually identified in terms of his/her personality development. Necessary inputs are provided to bring about changes in their personal and social behaviour besides providing them development. The development takes place in both aspects namely, scholastic and non-scholastic. With a view to providing feedback for further improvement some kind of assessment or evaluation becomes essential. The outcomes of evaluation largely depend upon the identification of types of tools employed for the purpose, the criteria of evaluation and interpretation of the result. Relevence, Reliability and validity of evaluation procedures determine the quality of feedback, which can be derived for ensuring qualitative improvement amongst learners.

While evaluation needs to be as realistic as possible it needs to be done in a cooperative spirit. Participatory and transparent evaluation can encourage learners to learn more and more who may ultimately turn into life long learners. Fear of external examinations, which get introduced in the minds of children from a very tender age needs to be removed. Teachers may be given full responsibility of evaluating children's progress under their charge, which they should perform in a professional manner. Necessary training and assistance should be provided to them before making them accountable.

Continuous evaluation refers to the evaluation by teacher alone, which he/she can perform on minute to minute basis for which he/she needs to be a keen observer having evaluative eye. This will, of course, be informal in nature. Further continuity of evaluation can be maintained through periodical assessments of learning which should be utilised for diagnosing the areas of difficulty and arranging for remedial instruction. Attempt should be made to help the learners in attaining mastery.

Comprehensive evaluation takes a comprehensive view of learners' progress covering scholastic and non-scholastic aspects. Emphasis should be given to recording of the assessment of personality qualities including attitude, habits and values of the learners and they should be helped to develop qualities necessary for making of a good and contributing citizen. Such assessments will also be recorded periodically and cumulative record cards prepared.

Evaluation process should be demystified and made transparent by taking parents and community into confidence. Inter-learner comparisons should be minimised. Communication of evaluation outcomes needs to be attempted in a positive manner, which should encourage learners offering themselves for evaluation rather than taking it as an imposed thing. Competency with regards to self-evaluation should be inculcated in a gradual manner. Attempts must be made to identify evils of evaluation, which have cropped into the system and eradicate them so as to restore faith and confidence of people in evaluation practices.

1.2.17 Education as a Life-Long Process

Education in order that it avoids the catastrophe of human obsolescence needs to be a life-long process. This in any way is not a new assertion or a faith but holds true and relevant even today. Education essentially has two major dimensions – temporal and spatial. While education should continue throughout the life span of an individual since there are particular developmental tasks and problems to be solved, it at the same time takes place among different life-spaces. These life spaces are home, school, community and media each playing by themselves a very important role in the total development of an individual.

As a life-long learner an individual develops an increasing awareness of the modern world, the rapidity of changes occurring in all walks of life, the phenomena of expansion and obsolescence of knowledge, and of changes in life-roles as well as psychological conditions at different stages of life. In order to achieve this purpose, the curriculum areas or subjects of study should be selected in such a manner that they provide a basis and choice for further education both in general and professional fields. Special importance may have to be given to the mastery of an instrumental subject like one or two languages to develop communication skills for further learning.

In the process of selection and organisation of content, the emphasis needs to shift from specific bits of knowledge which quickly become obsolete, to those aspects while constitute the structures of subject, key concepts of the curriculum area, and tools and methods of inquiry specific to the subject. In other words, the curriculum areas or subjects should be designed in such a way that they provide tools of inquiry, basic starting points and practice grounds for acquiring the methods and tools of learning.

1.3 TOWARD A CURRICULUM OF THE UNKNOWN

The world of today is witnessing developments and changes that are coming too fast and that demand our immediate attention. These would not wait for the normal ten or twelve year curricular cycle in order to be included in the school curriculum. Every learner in a dynamic learning society has to be familiar with such areas of knowledge in various disciplines of learning in the global context. In order, therefore, to keep our learners' knowledge base up-to-date, we have to add a small quantum, say not more than 10 per cent of the total curriculum, to the regular curricular content every two or three years. Simultaneously, the redundant portions of information in the existing curriculum to the extent of about ten per cent may be carefully deleted so that the exercise may not result in any additional curricular load for the learners.

Some of the learning areas that would deserve inclusion in this Frontline Curriculum right now could be the latest developments in communication system, space technology, biotechnology, genetic engineering, recent health issues, energy and environment, world geography, multinationals, archaeological findings etc.

Initially, the teachers will have to learn how to be co-learners with the pupils as the areas of the frontline curriculum will generally be unknown as much for them as for their pupils. Gradually, the pupils will have to cultivate the habit and skill of self-learning and self directed learning to acquire knowledge in the frontline curricular areas.

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1.4 THE APPROACH TO CURRICULUM DEVELOPMENT PROCESS

Curriculum development is the process of transforming images and aspirations about education into programmes that will effectively realise the vision that initiated the process. Curriculum development is a total process in which different components such as curriculum planning, formulation of a curriculum policy, its implementation and thereafter evaluation play an important role.

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The role of curriculum development is considered to be of such importance for national and state policies that in the majority of the countries of world this responsibility is shouldered by the various governmental and national level organisations and agencies. In fact no national government can afford to wash off its hands from the curriculum development process.

International experiences have shown that neither the centralised approach nor the decentralised approach to the curriculum development in its entirety has really been successful. Countries of the world which at one point of time had tried with decentralised approach to curriculum development had to revert back to some kind of a nationally developed centralised curricular policy.

The NCERT by way of its mandate and the long experience of more than three decades in this field has developed strong professionalism and credibility. The model of curriculum development that it follows could be labeled as one of **coordinated decentralisation**, meaning thereby that while the broad framework gets developed at the central level, at the same time it does not go to the states as a prescription. In evolving the curricular policy the views and participation of all the stakeholders from parents to teachers and various other members and interest groups of the society is fully well ensured. The curricular framework generates creative thinking at various levels of decision making such as at the national, regional, state and district levels. As such it provides great deal of flexibility to provide space for local specificity and contextual realities.

Organisation of Curriculum at Elementary and Secondary Stages

Chapter 2

The experience of the country gained in the field of school education since the existing *National Curriculum Framework* was introduced and the magnitude and impact of all pervading changes during this period demand a fresh look at our main thrust areas, reformulation of some of these and reaffirmation of the rest. In keeping with our developmental priorities of today and the foreseeable future, the basic features and main thrusts of the New Framework could be visualised as follows.

(i) Emphasis on the development of human resources to put the young men and women of India on the fore front of development for the realisation of the national goals of education, prosperity and social cohesion.

(ii) Broad-based general education to all learners at the elementary (5 years of primary and 3 years of upper primary) and secondary (2 years) stages. It will help them become life-long learners and develop in themselves basic life skills and emotional intelligence for sustenance and coping with the challenges of day-to-day life.

(iii) A broad-based common scheme of studies for the elementary and secondary stages with emphasis on the skill of "learning how to learn".

- At this point, however, there may arise a question whether uniformity of structure and scheme of studies is desirable, especially at the elementary stage, in view of the school grade system and single teacher schools.
- Another issue that merits consideration is whether the scheme of studies at this stage has to be common, ignoring a sizeable number of those learners who are either disabled (about 10% of the total number of learners) slow learners or the gifted ones. If yes, ways to cater to the needs of these special groups of learners under a common scheme of studies at this stage will have to be found.

(iv) The 1976 addition (Part IV A, Article 51A) to the Constitution of India laid down some Fundamental Duties which exhorted all Indian citizens to (a) abide by the Constitution and respect its ideals and institutions, the *National Flag* and the *National Anthem;* (b) cherish and follow the noble ideals that inspired our national struggle for freedom; (c) uphold and protect the sovereignty, unity and integrity of the country; (d) defend the country and render national service when called upon to do so; (e) promote harmony and the spirit of common brotherhood among all the people of India transcending religions, linguistic and regional or sector diversities; (f) renounce practices derogatory to the dignity of woman;

(g) value and preserve the rich heritage of one composite culture; (h) protect and improve the natural environment and have compassion for living creatures; (I) develop scientific temper, humanism and the spirit of enquiry and reform; (j) safeguard public property and abjure violence, and (k) strive toward excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

The National Policy on Education 1986 reflected almost every element included in the Fundamental Duties. All these elements were spelt out in the *National Curriculum Framework,* 1988 as the common core and, hence need to be reaffirmed.

(v) The common core components comprise the following:

- (a) The history of India's freedom movement.
  - However it is also felt that this should appropriately lead on to India's struggle for development and growth after independence.
- (b) The Constitutional obligations
- (c) Content essential to nurture national identity
- (d) India's common cultural heritage.
  - Some interpretation of 'common culture' excludes India's ancient and medieval cultures. The real spirit of this element must be understood and according it should be decided whether 'uniformity of cultures' or 'unity of cultures' is intended here.
- (e) Egalitarianism, democracy and secularism.
  - **Secularism, in the present educational parlance, has wrongly been misunderstood as rejection of religion.** There has now emerged an opinion that the term ought to mean equal understanding of and respect for all religions 'Sarvadharma Samabhava' or 'Panthanirapekshata'. This interpretation, as also accepted by the Sriprakasa Commission (1960), facilitates the view that religion in its basic form (devoid of myth dogma and ritual) would draw younger generation to basic moral and spiritual values.

In this context Mahatma Gandhi also asserted,

> *"The education which leads to the negation of God cannot make for the service of the country nor of humanity".*
>
> *(The Hindu, 21 July 1927)*

- (f) Equality of sexes
- (g) Protection and preservation of the environment
- (h) Removal of social barriers
- (i) Observance of the small family norm, and
- (j) Inculcation of scientific temper.

- There, however, seems room for some more components that may claim the status of 'core components' in the changed and fast changing national scenario even if we do not follow the 'panic approach'. These may be:
  - (a) Human Rights including Rights of the Child and those of the Girl Child.
  - (b) Inculcation of personal and social values such as cleanliness, compassion, truthfulness integrity, responsibility, justice, respect for law and order, courage and the values cherished for the functioning of democracy.

(vi) Emphasis on ensuring to minimum essential level of acquisition of knowledge, understanding and skill in all subjects at all stages, commensurate with the learners' abilities and learning experiences.

(vii) Provision of flexibility in terms of selection of content/components and learning experiences which would facilitate the attainment of minimum essential level of knowledge/skill laid down for each stage of school education.

(viii) Emphasis on learner centred and activity-based processes rather than the teacher-centred content-based approach during curriculum transaction.

(ix) Recasting of the examination system and introduction of continuos and comprehensive evaluation that incorporates both – scholastic and non-scholastic aspects of education spread over the total span of instructional time.

(x) Provision of remedial teaching as well as counselling services for carrying out the diagnosis of learning problems and providing support to the needy learners' groups.

(xi) Setting up an appropriate system of National Testing Service (NTS) for the selection and development of norms of comparable competence across the nation.

(xii) Applicability of the curriculum to all learners irrespective of their modes/ channels of learning in order to ensure comparability of attainment and to facilitate horizontal and vertical mobility of the learners.

- However, one has to re-examine the assumption that comparability of attainment and applicability of the curriculum to all learners despite difference in their modes/channels of learning could be possible.

(xiii) Provision of essential facilities or the minimum conditions for learning through effective transaction of curriculum in all schools and centres of alternative schooling centres.

2.1 MINIMUM LEVELS OF LEARNING

In order to bring about a broad commonality in the standards of education throughout the country, introduction of the norms of minimum levels of learning, or the essential levels of learning outcomes for each stage of school education, has been emphasised in respect of each curricular area. In some western countries such norms have been introduced in the form of national standards. These minimum learning outcomes are to be specified according to the research findings regarding the mental ability of pupils at different stages of their development and the academic and physical resources that could be made available in the school for effective transaction of the curricula.

Although a part of the NPE 1986, the concept has rarely been understood in its real spirit. The word 'Minimum' has generated a lot of debate, sometimes genuine and sometimes motivated. But if it is taken to mean the basic, essential standards of achievement for one and all at a particular stage, the term conveys reasonable amount of clarity. A doubt has also been raised about the feasibility of ensuring the 'essential' or minimum' levels of learning outcomes among all learners at a given stage despite differences in their mode and pace of learning. With well conceived and skillfully implemented diagnostic and remedial interventions, the concept of MLLs could be made feasible.

It needs to be clarified here that the concept of MLLs is not fragmentary – as it has been misunderstood to be by some – but holistic in nature. The marshalling or sequencing of skills of units of learning outcomes is to be done in such a way that it involves in a balanced way the analytico-synthetic processes. Moreover, 'learning' is to be taken in the broad sense of 'skill', 'quality', 'attitude' and 'value' too. In that sense, the term would embrace all the cognitive, psycho-motor and affective area learning outcomes of education.

The emphasis on defining the MLLs highlights the importance of the integrative nature of learning – evaluation to ensure an effective diagnostic intervention and assessment procedure. Thus, learning (development) and evaluation (assessment) have been construed as two inseparable aspects of the same phenomenon. It is futile to evaluate the progress of learners toward the stated objectives unless it is ensured that conscious efforts have been made to provide adequate and appropriate learning experiences for growth and development. Thus, a major shift from passing judgement to development in terms of the desired objectives has been advocated.

Sometimes it is argued that if 'learning' would include qualities, attitudes and values also, subjecting them to a standardised and scientific process of evaluation involving some kind of 'measuring' the levels of attainment would not be possible. Here it may be understood that every 'learning' in cognitive, psycho-motor or affective domain has some observable manifestation either real or even simulated, in the learner's behaviour which can be evaluated holistically. Even the presence of certain quality or value in varying degrees or the absence of it can be found out through careful observation of the learner's behaviour over a period of time as a part of continuous and comprehensive evaluation process.

While emphasis has been laid on the introduction of the norms of MLLs and adoption of a common scheme of studies at different stages of school education, flexibility is envisaged in the selection of strategy for curriculum transaction in order to make learning more relevant to the needs and environmental contexts of the learners and to allow scope for initiatives and experimentation on the part of the teacher, the school and the local educational authorities. A high degree of flexibility and local initiatives are envisaged in designing and introducing remedial and enrichment programmes and materials not only by the state educational authorities but also by the individual schools and teachers to cater to the needs of slow and fast learners studying in the same class/grade in a school. However, the scope for flexibility in the methodology and approach to curriculum transaction is not expected to be used for introducing differential courses or similar measures which would accentuate disparities in standards of education in different parts of the country.

2.2 COMMON CORE COMPONENTS

While the rationale underlying the school curriculum of a country reflects its socio-cultural and political ethos and policy decisions, its faithful transaction reflects the genius of its people. Some other factors, like the country's resources, are also important in this context. The search for national identity has been on since the resistance to colonisation of the country began. This search has not ended yet. On the converse, it is more acutely felt now than ever before. Naturally, therefore, there is a strong plea for centering the curricular efforts for promotion of national integration, social fusion and cultivation of values as enshrined in the Constitution. Thus, an important aspect of the common core components is the emphasis on instilling a nationally shared perception and values and creation of an ethos and value system in which a common Indian identity could be strengthened.

However, it needs careful consideration how much emphasis on 'national identity' could be appropriately put in view of the process of globalisation even in areas other than economy, market, technology and the like. In the matter of daily life and thinking process it is difficult to strengthen individual national identities. Whether we have an exclusive Indian identity today needs very careful scrutiny.

Suitable strategies for introducing the common core components at all levels of school education are to be found out. Some of these could be as follows :

(i) After the minimum learning outcomes/levels and related general content are identified for each area of learning, further scrutiny may be made to explore the possibility of infusing the specific core component with the theme.

(ii) Where such natural fusion is not possible, an attempt can be made to select new content for each of the components to be added as topics/units to each relevant subject. Cyclic development of a new course of study pertaining to each of the components can be envisaged. But utmost discretion in the matter is to be exercised lest it should result in additional curricular load.

(iii) It is also possible to integrate such content appropriately in the regular subjects included in the scheme of studies.

(iv) An eclectic organisation is possible by way of integrating clusters of components such as social science components or science components or moral value components and designing syllabi for different grades.

(v) These components and concerns could also be reflected in the general reading materials/self-learning packages and evaluation tasks, exercises or examination materials, question papers etc.,

At the primary stage, core components and values could be integrated with the language, environmental studies and even mathematics to make them a medium to develop appreciation of culture and perception of the individual, social and national identity through activities, songs, stories, plays, skits, reading materials etc..

At the upper primary stage both infusion and unit approach could be adopted.

Similarly, at the secondary stage many core areas may be integrated with civics, economics, history and geography. In some cases, even separate units may be developed around these areas. The core components could be made more interesting through visuals and biographical notes on eminent Indians who have left their mark in different fields. However, while introducing the core components, it is necessary to ensure that the depth and coverage of information is kept at the appropriate level and does not add to the total information load in any subjects. This could be done by reducing the content load discreetly in the concerned subject areas and suitably blending the core components in the total scheme of studies as far as possible.

2.3 FORMULATION OF OBJECTIVES

In curriculum organisation formulation of objectives has a significant place because these play a fundamental role in determining the content, strategies and evaluation as components of the curriculum cycle. While identifying objectives, it is necessary to proceed towards various degrees of specificity, from very general objectives of curriculum, through somewhat specific objectives for each stage of education, to precisely stated specific objectives of each subject area in the form of expected learning outcomes indicating the exact behaviour a learner would be able to demonstrate after the curriculum transaction. Thus, curriculum organisers would indicate, at the outset, the overall objectives of curriculum which would coincide with the overall aim of school education. Then stage-wise objectives are to be carefully formulated keeping in view the developmental characteristics and level associated with different stages of education. Each subject area would have its own specific objectives clearly defined in behavioural terms. However, it must be remembered that human learning makes one unified whole and that separate subject areas have been created only for the sake of convenience.

2.3.1 General Objectives of Education

School curriculum should aim at enabling the learners to acquire knowledge, develop understanding and inculcate skills, positive attitudes, values and habits conducive to the allround development of their personality. Learners are a nation's assets and they are to be empowered through education to increase their scope and capability to do and to be. Simultaneously, school curriculum has the onus of minimising and, if possible, eradicating the country's 'liabilities' like ignorance, poverty and moral weaknesses. Paradigm shifts are therefore necessary to support a curriculum that values the interaction of process and content. Besides, the development of intrinsic values and emotional intelligence of learners are also crucial.

School curriculum should, therefore, help to generate and promote among the learners:

1. Language abilities (listening, speaking, reading and writing) needed for social living and further learning;
2. Communication skills (verbal and visual) for effective participation in day-to-day activities;
3. Mathematical abilities to develop a logical mind and enable learners to perform simple mathematical operations and their application in every day life;
4. Scientific temper characterised by spirit of enquiry, courage to question and objectivity leading to elimination of obscurantism, superstition and fatalism;
5. Knowledge of scientific methods of enquiry and its use in solving problems;
6. Understanding of the environment in its totality (natural and social, and their interactive processes), the environmental problems and the ways and means to preserve the environment;
7. Abilities to investigate into various issues and problems at the local, regional, national and global levels and to make one's own independent assessment;
8. Appreciation of sacrifices and contributions made by the freedom fighters and social workers in India's freedom struggle and social regeneration, and readiness to follow their ideals;

9. Qualities that make a person humane and socially effective, giving meaning and direction to life. These values may be clustered around social/economic and personal/spiritual values;
10. Understanding the diversity in lands and people living in different parts of the country and the country's composite cultural heritage;
11. Appreciation for the need of a balanced synthesis between the change oriented technologies and the continuity of the country's traditions and heritage;,
12. Knowledge of and respect for our national symbols and desire and determination to uphold the ideals of national identity and unity;
13. Understanding the positive and the negative impact of the processes of globalisation, liberalisation and localisation in the context of our own country;
14. Knowledge, attitude and habits necessary for keeping physically and mentally fit and strong in conformity with the normal developmental pattern;
15. An awareness of the inherent equality of all and the need for global fraternity with a strong commitment to human values and to social justice;
16. Application of and readiness to practise in life the national goals of socialism, secularism, healthy democracy and non-violence;
17. Qualities and characteristics necessary for self-learning, self-directed learning and life-long learning leading to the creation of a learning society;
18. Pre-vocational/vocational skills, willingness to work hard, enterpreneurship and dignity of manual work necessary for increasing productivity, obtaining job-satisfaction and creating wealth generating systems;
19. Ability to discover and appreciate beauty in different life situations, and integrate it into one's own personality;
20. Capacity not only to accumulate factual information but also to understand, reflect and internalise and develop insight;
21. Capability of appreciating and tolerating differences and diversities of various sorts/ideologies and the capacity to choose between alternative value systems;
22. Appreciation of various consequences of large families and over population and need for checking population growth; and
23. Cultivating proper understanding of and attitude toward healthy sex related issues and healthy, respectful attitude toward members of the opposite sex.

2.3.2 Objectives at the Various Stages of Education

The emphasis on the 'learner-centered approach' necessitates careful determination of the objectives of education to be achieved at a particular stage/class in keeping with the norms of physical, mental, social, emotional and normal development of the learners of the relevant age-group. Specific expected learning outcomes related to each objective for a particular stage/class have to be worked out with a certain amount of precision.

Most of the objectives listed in 2.3.1 above should continue through various classes. However, the level of achievement with regard to a particular objective will be rising from one class to another in a spiral fashion. Thus, there will be a sort of learning continuum so far as targets of achievement with regard to a particular objective are concerned and it will reach its terminal point at a particular class level depending on the nature of the concerned objectives.

2.3.3 Characteristics of a Learner

Recent thinking is warmed up with the contention that a learner is not a passive object; nor is sinful and incompetent. On the contrary, a learner is an active and competent person. He is an active individual in the sense that it is not only the environment which shapes him, rather he too shapes the environment to a great extent. Thus, the learners do not come to the classroom with a blank mind/state but with pre-conceived ideas. The classroom experiences are interpreted by the learners in the context of these pre-conceived notions. In this way, the prior experiences, beliefs and emotions affect the individual perception and interpretation of events. This knowledge acquisition is a constructive or generative process and each student's knowledge is personal or idiosyncratic.

For long the child or learner was viewed as a natural or given category. This made us blind to the fact that the development of the learner is intimately linked to changes in socio-cultural and historical condition in a given society. Thus, differences across groups and changes within a group may change the nature of the learner. Thus, a monolithic view of the learner is untenable. Also, adapting an integrated approach towards understanding the characteristics of learners seems more appropriate.

During pre-primary stage, enormous changes take place in physical growth and development. From a state of dependence and helplessness the children attain independence and become curious learners. As their bodies grow and respond to social and cultural cues, their nervous systems mature and their cognitive experiences are enhanced. They quickly adapt to the world, slowly begin to imagine and future involving themselves and others, and discover methods for storing away memories of past and present events. Play fosters the cognitive, language, social, emotional, and personality development of the learner. Learners may engage in functional (e.g. simple, repetitive movements with or without an object) and constructive (physically manipulating objects in order to construct or create something) play. This period is marked by development of language, use of symbols and ego centric thinking (e.g., failure to distinguish between one's own point of view and that of another individual). Children also engage in fantasy play.

The child enters the primary stage when physical development seem slower and less eventful. They become slimmer, more muscular and master new skills which enable them to compete more effectively against their peers. During this period underweight and malnourished children encounter considerable health risks and obstacles to normal physical, social, and cognitive development. Also, overweight children experience unique problems, particularly as regards childhood obesity. Depending upon the child's eco-cultural system and developmental niche, which emphasises different motor skills, children become better coordinated. The child's thinking is governed by the fundamental rules of logic. Here, the concept of *zone of proximal development* (ZPD) attains significance. ZPD refers to the distance between a child's actual development level and the higher-level potential. It is the difference between what children can achieve independently and what their potential level of development might be if given help or guidance. The cognitive capacities of the learners is enhanced when instruction is focussed on an individual's potential rather than on the level of actual development. This concept of ZPD emphasised Vygotsky's view that social influences contribute significantly to children's development of cognitive abilities and the mentoring or guidance strengthen their development. From egocentric speech (which serves to control the child's own behaviour, and is usually verbalised), the child develops inner speech which consists of self-talk, during which children rehearse what they are going to say before actually saying it. The social development of the child is regulated by the peer group. In the company of their peers, children learn to cope with everyday conflicts and fears through fantasy play. They also engage in fantasy play to deal with anxiety and violence. In interaction with other children they acquire a sense of cooperation and sharing.

At the upper primary stage, a lot of physical changes takes place in children as it is a period of biological transition between childhood and adulthood. At the cognitive level, the child is gradually able to think logically in terms of all hypothetical situations relevant to a particular problem. The child gradually acquires the ability to deal with hypothetical problems and abstract thinking (e.g. mentally thinking about two different routes that could be taken to the same destination). The children encounter to establish an identity of their own. The process of identity formation requires taking into account one's own view as well as the views of others and of society. The importance of peer group increases considerably. The children experience frequent mood swings and conflicting thoughts.

At the secondary level, the characteristic developments mentioned during upper primary stage gets strengthened. Thinking with abstract concept, establishing social identity, importance of peer groups increases considerably.

It is also necessary to promote social interactions among children. For effective learning and for intellectual development, learners should cooperate with their friends, share their experiences, discuss their discoveries and argue out their differences of opinion.

The development of concepts is a gradual one in a child. The teaching learning process should be designed in such a way that it helps in promoting the continued development of the overall cognitive structures. This calls for the provision of a variety of tasks, materials and problems appropriate to the current cognitive structure of each learner. The learners should be presented with objects and ideas which could be manipulated and experienced, which would provide real opportunities for significant and meaningful sensory experience. They should be initiated and encouraged to explore texture, appearance, sound, odour and to sense movement,. Emphasis should be laid on formal abstraction of attributes and relationships of objects and events appropriate to the level of development.

Characteristics other than the intellectual ones also provide important guidelines for designing curriculum which could be geared to the all-round development of the learner as a person and his development in the context of national goals and socio-cultural priorities. His physical, social and emotional characteristics and his attitudes and interests that emerge in him during the course of development during childhood, early adolescence and mid-adolescence, should be carefully taken into consideration while determining the objectives, content and strategies of curriculum and its transaction at pre-primary, primary, upper primary and secondary stages.

With regard to the developments of beliefs, habits and attitudes that have to do with physical well-being, emotional maturity and proper social orientation, the period of pre-primary and primary education is the most impressionable and formative period of the child's life after his/her entry to the school. This fact should be realised in all seriousness by the curriculum designer and practitioner so as to adequately provide appropriate learning experiences to the learner.

The entire span of pre-primary, primary, upper primary and secondary education is accompanied by significant physical growth and related needs, inclinations and motivations on the part of the learner. While undergoing pre-primary and primary education, the child, though relatively physically delicate, needs sufficient physical activities within and outside the school that would develop in him/her neuro-muscular coordination, keep him/her physically fit, ensure his/her future physical strength and provide a worthwhile channel for the bubbling energy he/she is endowed with during this period.

What is of utmost importance during this period is imparting of appropriate knowledge, habits and attitudes conducive to personal hygiene and providing for regular guidance by medical experts.

Special need for enhanced consideration of physical characteristics of the learner arises with the onset of puberty in her/him towards the end of upper primary stage or during the secondary stage. The accompanying bodily changes, and also the associated feelings and interests, give rise to the need of imparting, sufficiently in advance, the relevant information and guidance.

During the period of secondary education, the learner is endowed with a fully developed neuro-muscular system necessary for finer manipulations required in steady handling of delicate tools and apparatus including those used in laboratory work. Curriculum should make appropriate provisions of manual work.

By the time the child enters the school, he/she has, in normal course, already developed a readiness for participation in group life with his/her peers. However, a critical outlook towards social conventions and social events, and appreciation for lofty social ideals are yet to emerge in his/her behaviour. Similarly, though he/she begins at this stage to distinguish between right and wrong, he/she has not yet developed higher moral ideals that are involved in the process at a later stage of development. The child demonstrates in his/her behaviour a desire not to depend on others, but crystallisation of desire to become self supporting takes place gradually till the learner is undergoing secondary education. In normal course, a learner, during the secondary stage of education, should develop a satisfying philosophy of life that would provide him/her appropriate motives and directives of behaviour as a future adult. Towards the end of upper primary stage, the learner starts critically evaluating the contradictions that he/she observes in the words and deeds of individuals and the society. Awareness of the need of standing on one's own legs and of choosing an appropriate career is normally demonstrated in the learner's behaviour.

These developmental features indicate the need for gradual introduction in the curriculum of learning experiences related to ideas, attitudes and skills that have to do with moral values, national ideals and priorities, socio-cultural cohesion and global fraternity. Systematic provision of information and guidance that would help the youth in making a right choice of career and vocation for themselves should not be overlooked towards the end of upper primary stage and particularly during the secondary stage of education. For a large number of students, some kind of pre-vocational orientation may be required to be a part of their education during the secondary stage.

During the period of secondary education, emergence of desire and inclinations of sexual nature is a normal feature of pupil's psycho-physical development. This dimension deserves careful attention of the curriculum organiser so as to make adequate provisions for inculcation in him/her of appropriate ideas regarding of, and healthy attitudes towards sex and members of opposite sex.

Curriculum designers could hardly afford to overlook the emotional dimensions of the child's life during the school period and the importance of emotional maturity in the life of a person. It is only gradually, through growth, that the child achieves emotional stability and emotional independence. There are occasions, particularly towards the end of upper primary and during the secondary education, when the learner has to face intense stress and strain which may result in emotional crisis. Curriculum should provide for appropriate activities and experiences, of scholastic and non-scholastic nature; and counselling and guidance in this regard.

2.4 SCHEME OF STUDIES

A common scheme of studies is advocated for Classes I to X. The general objectives of education will be realised through the content and learning experiences related to different subject areas. However, the emphasis would shift from factual knowledge to the process of understanding, thinking and internalising. Besides, personality development, value education, health and physical education, art education and work experience, should be given appropriate importance in the school curriculum. The inter-connections among various subject areas should be clearly established.

The core component areas and values should form an integral part of the curriculum at all the stages of school and may suitably be integrated in different subject areas. Flexibility in selection of content and learning experiences should be built in the system.

2.4.1 Pre-Primary Education (2 years)

This stage of education would help children prepare for school later through group activities, play-way techniques, language games, number games and activities directed to promote socialisation and environmental awareness. Perception, pleasure and participation are to be emphasised. *No formal teaching of subjects or reading and writing* are to be undertaken at this stage.

- Although it is understood that a *National Curricular Framework* aims at providing a uniform stage structure for the whole country, it is found that the Pre-Primary Stage of education is not available to children in many States. In many others, it is not available in the rural sector. In some States the *'Aanganwadis'* exist but these do not function as Pre-Primary Education Centres.
- Although formal teaching of subjects and reading and writing skills are clearly prohibited at this stage, almost everywhere that is being done in these preparatory classes. This puts unhealthy and harmful load on children whose neuro-muscular capacities are not yet developed.

- In view of these two points we must think afresh whether it would be advisable to continue with the current discriminatory and stressful system of Pre-Primary schooling.
- In case it has to stay, we must also find out how it can be made uniformly available to all the children of the country and how its real objectives can be ensured.

2.4.2 Elementary Education (8 years)

Primary Stage (5 years)

A. Classes I and II

(a) One language – the home language/the regional language

(b) Mathematics

- These two areas will have centrally developed curriculum and curricula materials for classroom use

(c) Environmental Studies

(d) The three areas of Work Education, Arts (Fine and Performing), and Health activities may be put together and a suitable name may be given to them. This gets support in Mahatma Gandhi's observation that

> *Music should form part of the syllabus of primary education. The modulation of the voice is as necessary as the training of the hand. Physical drill, handicrafts, drawing and music should go hand in hand in order to draw the best out of the boys and girls and create in them a real interest in their tuition.*
>
> *(Harijan, 11 September 1937)*

- Schools should be given full autonomy to use locally developed curriculum and locally available resources for covering areas under (c) and (d).

B. Classes III – V

(a) One language – the home language/the regional language

(b) English

(c) Mathematics

(d) Environmental Studies

(e) The three areas of Work Education, Arts (Fine and Performing), and Health activities may be put together and a suitable name may be given to them.

- At this stage also schools should be given full autonomy as mentioned earlier for Classes I and II.

- In the changed socio-economic scenario and individual and national requirement generated by the process of globalisation and information technology, introduction of English at this stage seems to have been necessitated. It still should not be introduced earlier because : (i) before it can be introduced the learners' first language should be strong enough to be used as a resource for learning the second language, and (ii) the first two years, in very large number of cases, are to be devoted to a smooth transition from the home language of the learners to their school language or regional language.

Upper Primary Stage (3 years)

(a) Three languages
(b) Mathematics
(c) Science and Technology
(d) Social Sciences

- (e) Work Education, Art Education (Fine and Performing), and Health, and Physical Education (including NCC, Scouts and Guides)
- These three areas may be clubbed together and a suitable name may be given to it.

Secondary Stage (2 years)

(a) Three Languages
(b) Mathematics
(c) Science and Technology
(d) Social Sciences

- (e) Work Education/Pre-Vocational skills, Art Education (Fine and Performing), and Health and Physical Education (including NCC, Scouts and Guides)
- These three areas may be clubbed together and a suitable name may be given to it.
- We may also consider here whether Computer Literacy could also be added as one of the subjects (10%) at this stage.

2.5 CURRICULAR AREAS AT DIFFERENT STAGES

Imaginative and discreet planning of appropriate learning experiences makes it possible for the curriculum objectives to be realised. Well planned activities and teaching-learning strategies facilitate these experiences which, ideally speaking, should make an integrated whole. However, for the sake of convenience, these have to be classified under various subject areas. The nature of various stages of education and the developmental stages of the learners have their bearing on the planning of objectives, learning activities and strategies under each curricular area. The curricular areas and their stagewise treatment for this purpose are proposed as follows:

2.5.1 Language

Language learning at primary stage is the basis of all primary level learning in all subject areas. It is also crucial for a child's emotional, cognitive and social development. New entrants with poor language background remain poor learners in all areas unless specially helped in language learning. Failure to teach language skills properly in the early years will lead to difficulties in learning later through the upper primary, the secondary and the senior secondary stages of school education. Language education has the greater potential as a means to develop, progressively through various stages, attitudes and values related to all the core components by incorporating appropriate themes and adopting suitable teaching learning strategies.

Language education should encourage independent thinking. Children should be encouraged to express their opinions freely and interpret events around them and also the events in the past. It should motivate children to say things their way. Their natural creativity and imagination must be encouraged and fostered that will make them realise the basic difference between their verbal language and the language of mathematics. Thus, learning of language should find a central place in the total educational process.

- However, it appears to be a global phenomenon, at least in all the third world (developing) countries that despite all theoretical acceptance of the central importance of language education, practical effort in improving language education is not adequate, perhaps because of the fact that science and technology and some other related areas claim major attention and resources.
- Despite this phenomenon, the process of globalisation now forces educationists and education planners to ensure that children acquire sufficiently effective communication and language skills and are able to use effectively not only their own language but also English – probably the world language now – and the other regional languages of the country.
- Oral aspect of language should be duly emphasised in language education, and oral examination in language should find its due place in the examination system.
- The existing curriculum document prescribes shift of emphasis from the teaching of textbooks to extensive reading from Class IV and recommends that at least 10 to 15 books in addition to the textbooks should be read. On the other hand, in reality, in average schools even textbooks are hardly read. In this scenario will it not be practical to suggest that emphasis on extra reading may be given from the first year of the upper primary stage

and it should be continuously guided and monitored ? Will it be rational to prescribe any given number of books ?

- The three-language formula was formulated with the best of intentions and academic considerations. Under this formula, the first language had invariably to be the home language/mother tongue or the regional language. In a number of states/organisations/boards, however, the spirit of the formula has not been followed and the mother tongue of the people has been denied the status of the first language. Moreover, because of the changed socio-economic scenario, the difference between the second and the third languages has dwindled. Thus, in reality there may be two second languages for all purposes and functions. Some states follow only a two-language formula whereas in some other classical languages like Sanskrit and Arabic are being studied in lieu of a modern Indian language. Some boards/institutions permit even European languages like French and German in the place of Hindi. In this scenario, the three language formula exists only in our curriculum documents and other policy statements.
- What, then, should be our 'language formula' for the school stage ? Can the following be acceptable ?
- Every child's home language/mother tongue or regional language should be his/her first language to be learnt right from the first standard. English as a subject may be introduced in Class III and Hindi in non-Hindi speaking states and any other modern Indian language may be taught from Class VI. All these languages must continue upto the end of the secondary stage. No doubt, flexibility in choosing the exact grade/ class for the introduction of the second and the third languages is desirable.
- Could the classical languages be taught as part of a composite course with mother tongue/regional languages originating from them ?
- Normally when children come to school for the first time they are already fluent in their home language but their language skills are often ignored in bi-lingual or multi-lingual situations. Since the languages used at home and at school are mostly different, even in supposedly monolingual societies, the crucial issue that emerges is how to help children in reconciling these two languages, their home language and the medium of instruction. This situation becomes much more complicated when a child is introduced to a third language, national or international. In such a situation the home language of the children may be used mostly, say about 80% and the school language or the regional language may be slowly introduced in the oral form covering about 20% of the educational activity in the first two classes. This will initiate and smoothen the desired transition from the home language to the medium of instruction at school.

By the end of the primary stage, the standard regional language would become the sole medium of instruction.

- As stated earlier, the home language, not the second or third language, national or international, would serve as the medium of child's perception and socialisation and his/her mental, moral and emotional development. Formal teaching of language skills of reading and writing must be discouraged at this stage. Story telling, recitation of rhymes, singing of songs, playing games involving active language use may be profitably used. Free conversation with the teacher and classmates and participation in lively discussion should also be encouraged. Taking the children to outdoor trips and excursions, observation of the surroundings would involve new experience and add to the children's vocabulary. Dramatisation, picture reading, puppet play etc. which give opportunity to use orally or listen to language should also be provided for language learning at the pre-primary stage of education.
- At the time of entering the primary stage, whether a child has been to a pre-primary school or not, he/she has already mastered the basic structures of his/her home language/mother tongue in the oral mode and can freely use it for day to day communication needs. It is assumed that initially children possess, on an average, about 1500 words of their own language and a fairly large number of words from English which have been freely borrowed in their language. This total vocabulary increases very fast at the primary stage. Children have to be specially helped to acquire the basic skills of speaking (pronunciation), reading and writing in the first two years of the primary stage (Classes I & II). Special attention should be paid to the process of standardisation of pronunciation according to the norms in the regional language at this level. Similarly, the skill of good handwriting, correct spelling and right habit of silent reading with comprehension are also to be developed. Children's ability for creative self expression is to be properly developed.
- It is generally thought that by the end of the primary stage, a child should acquire about 5000 words of his/her mother tongue. However, with additional recommended reading this number of words perhaps could be higher.
- Despite all the constitutional provisions and policy statements, Hindi or any other Indian language has not yet been raised, in practice, to the position of the most popularly used language in administration, judiciary, business, industry and information technology, science and technology. English has increasingly been recognised as a tool for access, success, prosperity, prestige and upward mobility. Even the rural first generation learners aspire for learning English to secure for themselves a place in the successful and respected social class. Hence, there has been a continuous

pressure for initiating the teaching of English in the very pre-primary stage or latest by the first standard. However, formal learning of a second language at that early stage is not desirable and it results in avoidable learning load. Modern researches have also proved wrong the popularly held view that the earlier a second language is taught, the better it is learnt. In view of these contradictions, it is now considered both advisable and advantageous to introduce the formal learning of English in Class III. If some organisations/institutions still insist on starting English in Class I, it may be done only informally, mostly in the preparatory oral mode, in Classes I and II.

- At the upper primary stage, pupils' competence in both the languages has to be strengthened further to enable them acquire real life skills to be used in their future day-to-day life. In their first language, they should be introduced to various forms of literature. They should be able to react in speech and in writing to whatever they read and listen to. Balanced stress on both the applied side and the metaphorical aspect of the language should be laid. Creative expression and the ability to think on one's own should be encouraged and nurtured through language teaching with oral form of language finding important place in language curriculum. It is here at this stage that children should be exposed to applied or practical grammar in order to enable them to develop additional insight into the nature, structure and functions of the languages.
- Learners are also to be introduced to the third language (or the second second language). However, teaching of this language is to be planned keeping in view the reality that the exposure of the pupils to this language and the need for using it in real life situations would be comparatively restricted, pretty simple and not too frequent. As such, it should be quite satisfactory if the pupils learn to operate successfully, in speech and in writing, within the limits of a controlled vocabulary and graded structure and read with comprehension simple texts of description, narration, information, instructions, processes etc.
- At the secondary stage (Classes IX and X) in the first language full mastery over the applied form of language and good acquaintance with literary language should be aimed at. Learners should achieve maturity in oral and written expression and respond to what they listen to or read. Literary texts in prose and poetry of appropriate level should be provided to them so that they may start understanding and appreciating the depth and diversities of human mind. Teaching of grammar should be systematically strengthened so that the subtle usages of language are understood and suitably used. Creativity in language use should be encouraged. More importantly, selection of the teaching material must reflect an attempt, implicit or explicit, of inculcating desirable attitudes, appreciation of

and dedication to the values related to the core components of the curriculum. High order communication skill in the first language, with grammatical accuracy and appropriateness of style should be the main objectives of first language learning at the secondary stage.

- In English and modern Indian languages used as second/second second/ third language at this stage, the most important objective should be to make the learners capable of using the language in speech and writing whenever needed in life and read with reasonable speed for information and pleasure. A well balanced development of all the language skills at this stage is aimed at, but still, more and more reading materials of a suitable standard and literary value should be provided to the learners which will also create and nourish right attitudes and human and citizenship values. Grammar should not be taught as a theoretical subject per se, but it should be taught as practical or functional grammar in context with the minimum of theory. Similarly, too complicated or subtle literary aspects should be avoided.
- Thus, more and more aural-oral skills of language are to be emphasised in language education at the primary stage, all the four skills are to be aimed at in a balanced manner at the upper primary stage and slightly more attention is to be paid to the skills of reading and writing at the secondary stage. However, despite this marginal difference in the matter of importance to the different skills at different stages of school education, the most crucial and ultimate task of language education at all these levels remains to enable the pupils to use the languages effectively in either mode whenever and wherever required in their day-to-day life situations of all sorts.

2.5.2 Mathematics

Mathematics has played a pre-dominant role not only in the advancement of civilisation in general but also in the development of physical sciences and has now far wider application in other branches as well. Mathematics has been an inseparable part of school curriculum ever since the beginning of formal education and it continues to be so. The mathematics curriculum has undergone various changes from time to time in accordance with the changing needs of the society. Realising the need of the social necessities, Education Commission set up in 1964 recommended that Mathematics should be taught as a compulsory subject of general education upto Class X. Provision of differential courses and additional or elective courses, defeats the philosophy and purposes of general education and there could be just one course in Mathematics for all. Only international numerals (Hindu-Arabic numerals) symbols, conventions should be used right from Class I onwards. Since general education envisages Mathematics for all, the selection of content should be relevant to the practical needs of everyday life. The load of Mathematics curriculum should be realistic. While designing the curriculum for the primary level, the existence of a large number of single teacher schools, high dropout rate, unfavourable socio-economic conditions of a major segment of society, etc. should be kept in view.

The value or usefulness of bringing in calculators/computers into the Mathematics education system is recognised. However, many of the mathematicians are of the view that due to unsatisfactory socio-economic conditions of a vast majority of population, making the use of calculators compulsory or even optional is not desirable. On the other hand, many feel that the use of calculator after a certain stage up to which students are familiar with the process of multiplication, division, addition and substraction and use of computer should be allowed as it helps in doing the problem quickly and provides more time for them to learn. However, by and large, it is agreed that training in the use of calculators and other mathematical apparatus is desirable and should be imparted to all at a convenient point of school education.

Issues pertaining to Teaching of Mathematics

Mathematics is visualised as a means to train the pupil to think, reason, analyse and articulate logically. Further, since quantitative treatment of a subject area, measurement , analysis and reasoning are being increasingly involved in many other subjects, the relevance of Mathematics should be seen not only as a specific subject area but also in the context of, and as a concomitant to other concerned subject areas. The application of mathematical abilities in day to day life situations cannot be ignored. The fundamental aspects of Mathematics at primary level and upper primary level can also not be ignored. On the one hand modern technological and electronic devices (like computer, calculators) help us in understanding Mathematics and on the other Mathematics helps in improving technological devices. What should be the structure of mathematics upto 10 years of general education ? What type of Mathematics should be taught? It goes without saying that mathematical reasoning demands higher mental ability. Experiences have shown that the major its of students normally fail in Mathematics at the end of Class X. This frustrates not only students but also their parents. Many educationists feel that Mathematics should be compulsory only upto Class VIII, while some other opine that there should be two types of Mathematics courses at secondary level and senior secondary level. These courses should be need-based. At secondary level, there should be one course for those who will pursue Mathematics as their future career and another course for those for whom Class X will be a terminal stage. As such the important issue is what sort of mathematical skills and competency are required upto ten years of Mathematics education.

Mathematics in some of the states has been made optional. Unfortunately, in some places in lieu of Mathematics students especially girls offer Home Science. There is a strong feeling that Mathematics upto ten years of school should be functional and should not be loaded with commercial Mathematics and banking. Mathematics learning is badly affected due to the problem of the language in which books are written/developed. Concepts not properly communicated through the language of the textbooks or content not properly understood by students creates problem. While considering the compatibility of our Mathematics courses upto ten years of general education, some people strongly feel that topics of international importance may also be included in Mathematics, but these may not be made compulsory for all.

Like in sciences the concept of a Mathematics laboratory has emerged as a new dimension and especially so in the urban schools. Activity-based Mathematics at school level is going to promote learning of Mathematics in a big way. The opinion across the teaching community and parents is that there is lot of wastage due to failure in Mathematics at secondary level because the present content in Mathematics is not very relevant to the students' needs who would like to terminate their education at the secondary level itself.

In many schools in absence of qualified teachers Mathematics is being taught by non-mathematic teachers. The basic question that we need to address ourselves for any futuristic concern is whether Mathematics education can be left to the change of non-mathematics persons, knowing well that maximum failure takes place in Mathematics. In order to reduce this failure this situation may have to be readdressed.

The use of calculators in Mathematics learning is yet another issue that needs to be debated. Mathematicians strongly feel that at the initial stages of school education, i.e., upto Grade VI or so there should be no use of calculators. However, as soon as they reach Class VII they should be allowed to use calculators as by that time the basic principles of additions, subtraction, division and multiplication are clear to them.

2.5.3 Science and Technology

Science and Technology is a great human enterprise. It is a self-growing, self-pervading, self-accelerating and self correcting enterprise which originated in the collective curiosity of man since time immemorial. Therefore, Science and Technology should be treated as one of the crucial curricular areas. Open mindedness, curiosity, inquiring into the basis of all things, collection of data, demand for verification and proofs, statistical reasoning, acceptance of unwarranted conclusions and willingness to change one's opinion in the light of new evidence are the ferments which characterise the scientific enterprise. Every aspect of learning science must inculcate interest in learning science.

Science and Technology plays a decisive role in equipping a learner for understanding, interpreting and dealing with, in a non-scientific way, various facts and phenomena around him/her. Education in science and technology should aim at developing well defined abilities in cognitive, affective and psycho-motor domains such as spirit of inquiry, creativity, objectivity, courage to question and aesthetic sensibility. Therefore, curriculum in Science and Technology should be designed so as to enable the learner to acquire problem solving and decision making skills and to discover the relationship of science with health, agriculture, industry and other aspects of daily life. Scientific concepts and skills should help an individual to question the existing beliefs, prejudices and practices prevailing in society and act as a liberating force.

Science and Technology teaching should emphasise processes rather than facts, performing experiments, taking observation, collecting data objective analysis and classification of data and drawing inferences or making hypothesis and reaching out to an objective truth. Thus process skills only help in changing attitude and values that make up the Scientific Temper. Therefore, it is desirable that scientific concepts should be developed around experiments/activities.

It is expected that a pupil studying Science and Technology for ten years will acquire observation and analytical skills for self regulation, ability to use tasks, apparatus and equipment appropriate to his/her immediate and future needs, ability to identify factors operating in his/her surroundings and understand their casual relationships. He/she will also understand the basic scientific concepts, laws, principles, and apply them in solving problems.

Science teaching upto 10 years of general education aims to equip a pupil to know (i) about self (ii) about surroundings/environment, and (iii) universe. One would like to know how his/her body functions, what are its needs and how it can be kept fit.

In a nutshell science teaching upto the secondary stage aims at providing scientific literacy. Science operates through its processes and, when combined with technology, improves the quality of life and serves the society. Therefore, the basic philosophy of science is shifting from scientific literacy to 'Scientific and technological literacy'. By the end of the secondary stage a pupil is expected to develop certain basic scientific skills like applying cause and effect relationship interpreting phenomena, making measurement with precision etc.

The most important purpose of science teaching in general education (Class I to Class X) should be to fulfil the following seven dimensions of scientific literacy:

- Understanding the nature of science
- Ability to use the processes of science
- Ability to properly apply appropriate science concepts
- Ability to understand values that underlie science

- Ability to understand and appreciate the joint enterprise of science, technology and society
- Ability to develop rich and more satisfied view of the universe and to continue science education throughout life
- Development of certain manipulative skills which are required in day-to-day life situations

Pre-primary Stage

Though pre-primary education does not aim at imparting formal instructions in any of the school curricular areas, a number of activities like gardening, watering, playing with different materials and with different types of simple scientific toys, maintaining pets, going on nature walks, maintaining a science corner etc. can be provided at this age.

Primary Stage

At the primary stage, during the first two years (Classes I and II), study of science may form an integral part of environmental studies. In Classes III to V it will be one of the two components of environmental studies – one devoted to science and the other to social studies. In Classes I and II, a child learns mainly through concrete situations related to his/her immediate environment. The major thrust of science education under environmental studies in Classes I and II, therefore, should not be to impart information to the children, but to sharpen their senses, to encourage them to observe and explore their environment and to enrich their experiences related to different aspects of their immediate environment. This should involve informal and unstructured reactions to their environment which, during Classes III to V, should gradually be made slightly structured by systematically exposing children to a variety of objects, events and natural phenomena in the environment. In later years of primary education, the child should be helped to interact with the environment, discover and understand the scientific facts, concepts, principles and processes underlying various phenomena around him/her. In this process, the child should be encouraged to systematically observe and explore things and occurrences in his/her environment, formulate precise questions related to them, collect information based on concrete experiences, record and classify the observation systematically and draw conclusions including those related to cause and effect relationship discovered through simple experiments, activities and demonstrations. For understanding activities he/she will identify the local resources and will show his/her resourcefulness. At this stage, he/she must develop the skills of measuring length, area, volume, time, temperature etc. Science learning at this stage should promote in children attitude and values like objectivity, open mindedness, perseverance, precision and concern for maintenance and improvement of environment.

At the upper primary stage (Classes VI to VIII), the learner is expected to consolidate and strengthen the abilities acquired at the primary stage. In addition, the objectives should be to develop an understanding of the nature of scientific knowledge, and certain physical chemical and biological principles and their relationship to the operation of scientific principles. Now thought may be given to the teaching of science concepts, with illustrative examples of their technological uses in everyday life. At this stage there is need to emphasise that science and technology are inter-dependent, and both are needed for society. Instead of attempting to load the pupil with information from all the disciplines of science, efforts should be made to help the children to learn the key concepts which cut across all the disciplines. This would help them to become curious, aware and interested in science, At this stage the learners should be helped in developing processes of science in solving problems, making decisions and furthering their own understanding of the universe. The pupils should be encouraged to design their simple equipments, improvise experiments using local resources to understand scientific concepts and seek explanation of some natural phenomena. At this stage the learners may also be exposed to global concerns as well. Scientific skills relevant to life such as measurement of different physical qualities in appropriate units, purification and characterisation of matter and materials (including drinking water, or adulteration etc. should be emphasised.

Secondary Stage

The secondary stage (Classes IX and X) is the terminal stage of general education after which a large number of students would not go for higher education in science. Therefore, there is little justification in teaching contents that are required only for higher studies in science, The aim of teaching of science at the secondary level should be primarily directed towards developing scientific attitude, problem solving and decision making skills through learning of key concepts which cut across all the disciplines of science and making a scientifically literate citizen of the country. At this stage learners should be exposed to the basic nature and structure of science. The learner should be enabled to grasp the principles/concept in depth to understand the relevance of science to various areas such as agriculture, industry, environment, health and contemporary technology. More stress should be put on precision while handling an instrument/equipment and making some quantitative measurements. At this stage, students should be encouraged to work independently while collecting data, taking observations, analysing the data and drawing inferences from them.

The content of science should be organised on the basis of two guidelines, viz, contemporary science and learning ability of the learner. At this stage learners can understand various types of forces operating in nature, and their implications, environment and natural resources, energy and its conservation, delicate balance in nature and the role of science and technology in improving the quality of life.

Science by its nature should provide sufficient scope for directly contributing to important core components and related values like equality of sex, protection of environment, observance of small family norms and inculcation of scientific temper. At this stage it should be emphasised that scientific knowledge is tentative, possible, replicable, historic, empirical, holistic, and is based on observation and experimentation. Since this is a terminal stage of general education, Indian students should also be exposed to the contributions of Indian scientists. This conviction long back has been substantiated by the Indian Education (1964-66).

Science and Technology at School Level : Some Issues

There is a general feeling that students are subjected to a heavy load in science. Added to this there is hardly any time for teachers for undertakings/ experiments/demonstrations in classroom. There is also a feeling that since science teaching is not activity/experiment based, this also adds to their load.

Some of the countries have gone to the extent of prescribing science modules even for non-science students at the tertiary level. Is present science teaching upto the secondary level sufficient to inculcate scientific temper, making the student competent in decision making, as envisaged in our national policy documents? What quantum of science should be prescribed upto 10 years of general education?

There is a feeling that science taught upto 10 years of general education is not adequate for those students who will pursue their career in the field of science at senior secondary and tertiary levels. As such, they require additional input in science areas at the secondary level. Many educationists, school teachers and teacher educators in the country feel that students could be given the option of offering courses of two levels – A or B. One for those who will not pursue science beyond Class X and the other for those who will pursue science beyond Class X. Are students mature enough to decide their further career immediately after Class VIII? Another issue is, is not against the basic philosophy of undifferentiated curriculum upto ten years of general education ? Will it not keep some of the students out of track, especially those who will decide to move vertically later on and join the main science stream? Will it not create a socio-economic disparity, rural-urban barrier, a feeling of inferiority among children offering B courses etc. can the issue be resolved by offering some kinds of bridge courses ?

In the past the Ishwar Bhai Patel Committee in 1977 recommended two types of courses: A and B which were later on abandoned thinking that it would create discrimination among children. It was decided that there should be only one course for all and diversification should be allowed only after secondary stage. Still many feel very strongly that there are also students who are bright, motivated and capable of doing better and, as such, should be provided a different type of course which is appropriately more demanding.

Teaching of science at the primary level is fully integrated with environment (natural and human). Coming to the secondary level, it has been presented as a unified science where there is integration of various science principles, laws. However, this integration as available in the existing science books is only at the superficial level. This integration was done with the purpose of: (i) avoiding overlap of concepts and facts; and (ii) accommodating important areas of inter-disciplinary multi-disciplinary nature such as agriculture, oceanography, cosmology, health and nutrition and environment. There is a strong feeling that the course content of is Class X has more descriptive whereas Class IX Science courses is more concept centered. Perhaps, this is due to the obvious reason of the public examination which is only for Class X and not for Class IX. There is a strong feeling that at the senior secondary level, there is a conceptual jerk and, as such, there is no proper conceptual link between the secondary level and the senior secondary level of science courses.

As regard the curriculum transaction, there are normally two teachers in every school who handle the science curriculum. One teacher for 'physical sciences' (physics and chemistry) and one for 'biological science' (biology). In some of the schools there are even three teachers – teaching portions related to biology, physics and chemistry separately. As such, in classroom transaction the teachers are following both the disciplinary and the integrated approaches. The issue before us is which approach should be followed by one and all ?

Science, Technology and Values

After every five years the existing technology tends to get outdated and hence its shape five years hence cannot be predicted with certitude. Nonetheless, frames of the science curriculum will have to address the issue whether the rapid developments in the filed of information and communication technology would be able to bridge the gaps between the affluent and the poor and how we should exploit technology to serve the hither to unserved and the unreached. So far, the new technology has been widening this gap. Science teaching in this country has to nurture among the learners some wholesome attitudes and values like the courage to question and scrutinise our age old institutions and systems related to our culture, religions dogma and ritual. It will have to liberate the young generation from ignorance, prejudice and superstition. Science education will also have to impact to the students the spirit of enquiry and experimentation even in the areas where scientific evidence is not so far available to sustain some popular traditional faith and which have been rejected outright because of inpatient rationality and motivated cynicism.

Science education, no doubt, aims at developing the 'laboratory skills', the skills of learning to do, but it also strives to develop among the learners the problem solving skills, crisis management skills and decision making skills. Besides, it is expected to give to the learners aesthetic sense and a thrill emanating from the mystery all around. How can the teaching of science achieve all this? Could the content and processes of classroom instruction in science transcend the drab act of passing information and become an effective tool of ensuring internal transformation of the learners by sowing in them the seeds of the essential values like respect for dissention, humility, honesty, truthfulness and perseverance?

In order to accomplish this, we shall have to have a fresh look at our science curriculum and curricular materials for all the stages of school education. Our science and mathematics books will have to be made more comprehensible – both linguistically and conceptually. Some of our print materials may also be transformed into suitable, user-friendly media packages to supplement and reinforce our textbooks and other print materials. The present access to the vast world of information on the internet would certainly be influencing our total approach in the process of science curriculum renewal.

Laboratory Experiences in Science / Experiences Outside Laboratory

Science emerged out of experiments/activities. Experiments in science serve the purpose of clarifying the concepts, developing psycho-motor skills, and developing scientific attitudes and values.

Laboratory experiences which are based on the processes of science are missing from science teaching at present in our schools. This non-seriousness at school level is not only because of the lack of physical facilities but also because of the little importance we attach to the lab work/practical activities.

The present assessment/evaluation system in science education is one bottleneck in bringing improvement in the education system of our country. Unfortunately, what is not relevant to examination is not considered relevant to education. Evaluation in laboratory experiences is not attached much importance either at the secondary level or at the senior secondary level. In most of the board examinations, evaluation at the secondary level is done once by a school as an informal assessment and therefore, not given much importance by the school children. After the senior secondary stage during entrance examination of the professional courses (medical, engineering etc.) students are never tested in practicals and this results in non-seriousness in and a sort of apathy for practical work.

Laboratory experiences should be an integral part of science curriculum. How can we ensure that it is practised in true sense, is a matter of debate. What type of lab. experiences should be provided ? Should they be linked with concepts/content directly or linked with the skills to be developed ?

Coming to laboratory experiences stagewise at primary level, the main focus should be on nurturance of creativity of the students by providing activities which can be managed by using locally available resources by improvisation in the natural environment of the child. Primary level is supposed to be the foundation of the child. Students should be encouraged to use environment as their laboratory.

At the upper primary level, main emphasis should be laid on developing scientific skills and the process of science. At this level as well, environment should be the main focus and the child should learn from the activities which can be performed using local resources and to some extent readymade apparatus and equipments.

At the secondary level, students should be exposed to new type of experimentations which not only develop skills but also strengthen their concept of science. At this level students should be given opportunities to perform experiments independently. Coming to the senior secondary level, students should be given problems, investigatory projects and full freedom to work independently in laboratory. Lab experiences at this level serve all the three purposes as mentioned above.

The practical experiences relating to the teaching of different science subjects may not be restricted only to the formal Laboratory, but pupils can be provided such opportunities but taking them out in immediate environment and community.

2.5.4 Social Sciences

The study of social sciences is of crucial importance as a component of general education at the elementary and secondary stages of school education because it helps in understanding the human environment in its entity and in developing a broader perspective. It facilitates the learners to grow into well informed and responsible citizens, who could participate and contribute in the process of nation-building.

Issues

- What should comprise social science curriculum as part of general education and why ?
- What should be the nomenclature – Integrated form (social studies), or composite (social sciences) or independent ?

Traditionally history, geography and civics comprised the social science curriculum in the schools because they were considered to be basics in providing different dimensions of studying the development of human society – over time and space and in relation to each other. Gradually components of economics and sociology were also included. The *National Curriculum Framework 1988* followed this scheme. Social Sciences intend to prepare pupils for different tasks/roles in the society by equipping them with knowledge, confidence in their own value and the desire to take tasks for the common good.

At the primary stage, social sciences should follow an integrated approach. At the upper primary and secondary stage a composite course in social sciences may be followed.

However, one needs to review and reconsider the composition and the content of the social science curriculum in the present time especially in view of the future needs and aspirations. It is felt more than ever before that the progress made by the human society in every walk of life has brought in its wake a number of new challenges with more complexities. Besides, changes are taking place so rapidly that it is difficult to predict the nature of future challenges. Hence the challenge to education today is to develop students in a world where trends of the past no longer predict the future. In other words, students need to be prepared to face the unknown.

Globalisation, the on-going mega trend asks for more and more uniformity of spaces in pursuing globally open-organisations uniformity may be achieved at the cost of differences and diversity which comprise the basic property of human culture. Flexibility in ways of thinking, tolerance for different cultures and self-moderaton in exercising powers may be pre-requisite to guarantee the diversity of human cultures in future. Globalisation also carries with it the threats of economic and political instability as well as undesirable changes, for example, workers loosing their jobs to competition from imports. On the brighter side, globalisation opens up unlimited opportunities for growth and development by spreading markets and spreading technology and management expertise. In such a situation there is used for a curriculum which helps in developing emotionally intelligent learning societies, who 'learn how to learn' and also 'learn to live together'.

Along with globalisation, localisation is also going to have a tremendous impact on the future society. It may raise levels of participation and involvement of people. In a democratic set-up, with decentralisation of power, more responsive and efficient local governance in required. 'Panchayati Raj' is a good example. However, poorly designed decentralisation may result in financially overburdened local government without the resources on the capacity to fulfil their basic responsibilities of providing local infrastructure and service.

Information and Communication Technology has provided immense possibilities for the learner to acquire information and to use it. In today's world of 'information age', procuring information is not a problem. It is more important to learn how to select relevant information and process it for our use. Information technology needs to be used by students for studying social sciences. Computers may help learning in social sciences by way of providing the following:

- Computer aided drill and practice; computer-based games; computer simulation; and information retrieval. Along with these futuristic needs, the contemporary socio-economic challenges before our country need proper coverage in the social sciences curriculum.

  The major issues of the 21st Century having relevance for social sciences teaching in schools may be as follows:

- Poverty; population growth; food security; water scarcity; climate changes; and cultural preservation.

As such 'Environment and its resources-natural and human', and 'Development' seem to emerge as the key issues. In view of the above, it is felt that the social sciences curriculum should be issue/ theme-based rather than a systematic study of the individual discipline. These issues/themes should be relevant and related to the needs of the learners. It would be essential to consider the new areas such as natural disaster/crisis management, rural development and consumer education which have relevance in the present time, for their inclusion in the social sciences curriculum. They are not to be introduced as separate areas, but necessary content and processes in such areas would need appropriate place for inclusion. The other consideration to be kept in mind is to lessen the curriculum load. It would be desirable that the existing subjects/ disciplines of the social sciences shed information/content from the curriculum which is obsolete or may be postpone till the student opts for academic pursuit and offers the subject as an elective in the +2 stage. Mere reorganisation of the content will not yield the result. It needs planning the social sciences curriculum in its totality – content and process as well as evaluation.

Paradigm shifts are necessary to support a curriculum that values the interaction of content and process. For example, the old paradigm that "the intent of objective, linear and scientific/mechanical inquiry is to establish causality laws, truth and how to control and make accurate predictions", should be shifted to the new paradigm that "the quantum paradigm of process intends to continue seeking greater understanding of multiple causalities, non-linear and chaotic systems, interactions, connections and to continually discover hidden meanings". Similarly, the old paradigm of evaluation that "Evaluation of student learning is a summative measurement of how much content students have retained. It is useful for grading and segregating students into ability groups. It is useful in predicting success in later life and indicates aptitudes for profiting from more advanced academic instruction" should be shifted to the new paradigm that "evaluation is neither summative nor formative. Rather, it is a mechanism for providing feedback to the learner as a necessary part of the spiraling process of continuous personal development: self-analysing, self-evaluating and self-modifying".

In today's complex and intelligence intensive world, it would be desirable to develop *insight* and clear *thinking* required to meet the demands for speed, flexibility, quality and innovation. Processes, therefore, need to be given more importance as they comprise those life activities which stimulate thinking, creativity, collaboration etc. for internalising the basic concepts acquired from the content. This would help the students in developing the competencies required for facing the life-situation and becoming conscious of their own behaviour and the effects of these behaviours on others.

Issues and themes drawn from the areas – history, geography, economics, civics and sociology should be organised from simple to complex ideas as well as immediate to remote. Emphasis should be given more on the economic, political and social aspects of human environment especially the contemporary world that too with focus on India. While number of topics/areas may be reduced, the depth of inquiry should be increased to optimise the learners' experiences.

The core elements and the values may be integrated in the social sciences curriculum most appropriately and they need to be developed through rational analysis and value clarification. Values are not just abstractions, or/and ideas, which people have about what is important in life. But, values also have another dimension – an emotional one. They are powerful emotional commitments. Hence a careful planning on part of the teacher is required while dealing with values for both the emotional and intellectual growth of students.

In view of the above, suggested themes may be as follows:

- Our Past

  The content may include specific contributions of India to the world civilisation – in the fields of science, astronomy, methodology, mathematics, medicine, surgery, creative arts, thought and philosophy, architecture, public administration etc. in the ancient, medieval and modern periods.
- Our Cultural Heritage
- World civilisations and major historical developments in the world
- Environment Resources and Development
- Human – Environment Interactions – Processes and Patterns
- Contemporary society/India
- Social, economic and political institutions and their functioning

It may be modified to include/delete some issues/themes.

These themes/issues may be arranged and presented to suit the age of the learners and their learning experiences.

Pre-primary Stage

The pre-primary education does not deal with the study of social sciences. The main objective at this stage in the social development of the child. In order to attain the objectives, a variety of activities and programmes are directed at providing ample opportunities for a child to interact with other children and with his/her environment – natural and human. Developing desirable habits and manners for healthy social participation and forming positive attitudes are other objectives.

Primary Stage

The study of social sciences begins formally from Class I. It should be called 'Environmental Studies' at the primary stage. In Class I and II, children should be introduced to the environment as a whole without making a clear cut distinction between natural and human elements. While schools should be given full autonomy to use locally developed curriculum, it should be ensured that no textbook is prescribed at this stage. In Classes III to V, children should be introduced to the natural and human aspects of the environment. The child's mental horizon should be widened from his/her home, school and neighbourhood to the state, country and the world. Stories and narratives concerning everyday life, work, leisure and culture in the past, e.g. food, clothes, houses, transport, work etc. children should be given opportunities to investigate the changes in their own lives and those of their families. Similarly, great personalities of our country and the world, e.g. rulers, saints, scientists artists, inventors and social reformers, events and developments that have acted as major influences in shaping our lives in India or the world may be included in the curriculum. They should be able to observe, recognise and group various features/components on the basis of their commonality and differences. They should be able to question and record, and to communicate ideas and information by the end of Class V. Schools should be given full autonomy at this stage to use locally developed curriculum and locally available resources for teaching of Environmental Studies.

Upper Primary Stage

At the upper primary stage, the issues/themes identified earlier and drawn from History, Geography, Economics, Civics and Sociology should comprise the study of social sciences. The learner at this stage should be initiated into the study of India's past by selecting important/major events/episodes and developments – social, cultural and scientific in a chronological order and by making links among them as also the cultural heritage. India's contribution to the world civilisation be given due place. The learners should be helped to understand and appreciate some of the ancient civilisation of the world and their interconnections as well as some major historical developments of the world. The components of environment and their interaction should be studied in terms of processes and patterns. The students at this stage should be able to investigate and undertake studies on their own concerning simple questions. For example in geography students should be motivated to raise questions such as what/where is it? How and why is it changing? They should be able to recognise patterns, e.g. variation in rainfall between places, patterns of land use in a settlement. The diversities in land and people and their interdependence, the contemporary society – social, political and economic institutions and their functioning globalisation, and liberalisation and its impact, etc. may help students understand the social, economic and political issues in the right perspective. Social skills and civic competencies should be developed to help them participate effectively in the nation – building process. Use of information technology should be promoted in studying social sciences.

Secondary Stage

At the secondary stage, the same themes/isues may be expanded suitably with a focus on the contemporary India. As such the major developments in the recent past including India's struggle for Freedom, the social, economic and political developments and challenges in the post-independent India as well as the processes and patterns of human-environment interaction in India and the issues of environment and development may be included at this stage to provide a broad understanding. Students should be encouraged to take up few indepth studies in the form of case studies/project work to help them investigate and consider the issues that arise from people's interaction with their environment. For example, natural disaster study may be one of such studies. Contemporary issues and challenges of India, India's role in the world especially world peace, international cooperation, decolonisation and safeguarding of human rights should be given coverage. At the end of the secondary stage, the students should be able to show their knowledge, understanding and skills to a wide range of studies at various scale local/regional/ national. They should be able to describe interaction within natural and human processes and recognise patterns. They should be able to appreciate that people's lives and environment in one place are affected by actions and events in other places. They should be able to look for sources of information and analyse problems/issues rationally and scientifically.

Teaching of history should be objective and free from any communal, parochial, ideological and other prejudices. The stereotyped images and biases should be avoided in the teaching of geography as well as other social sciences subjects. New terminologies, trends and ideas should be integrated. Field-work, project work and group activities should form the basis of teaching-learning in the classroom. Economic and political literacy should be promoted. Along with other audio-visual materials, information technology should be used for effective learning.

- The following three areas are proposed to form one composite area of study in which autonomy and local specific curriculum may be the characteristic features. This area may be given a suitable name.

2.5.5 Work Education, Art Education, Health and Physical Education

Work Education

Work education, viewed as purposive and meaningful manual work, organised as an integral part of the learning process and resulting in either goods or services useful to the community, should be an essential component at all stages of education, and be provided through well-structured and graded programmes. It should comprise activities in accordance with the interests, abilities and needs of learners, the level of skills, and knowledge to be upgraded with the stages of education.

Work education should inculcate in the learners a respect for manual work, values of self-reliance, co-operativeness, perseverance, helpfulness, inquisitiveness, work ethics, attitudes and values related to productive work, and concern for the community. This experience would also be helpful on their entry into the work force. It should enable the learner to understand the concepts, facts, terms and scientific principles involved in various forms of work situations, know the sources of raw materials, understand the use of tools and equipment in production and service processes, acquire skills required in a technologically advancing society, and conceptualise his/her role in the productive situations. The programme should also help him/her in acquiring skills required for identifying, selecting, procuring, arranging and developing innovative methods and materials; observing, manipulating and participating in work practices, thereby enhancing his productive efficiency. Pre-vocational programmes provided at the secondary stage should also facilitate the choice of the vocational courses at the higher secondary stage.

At the primary stage, many activities and programmes, though not exactly fitting into the definition of work experience, should help in preparing a strong foundation for work education to be formally undertaken at the primary stage. They develop in the child neuro-muscular control and coordination, basic motor skills, desirable social behaviours and attitudes and positive self-concept in addition to habits of community living. Some of the activities that are aimed at working of finer muscles are tearing and pasting, cutting, threading, painting and printing, clay modelling and buttoning clothes. Various group activities encourage community living which is necessary for work education.

At the primary stage, work education programme should emphasise development of desirable healthy living and practices of sanitation and beautification, awareness of the world of work and work ethics. Activities in relation to various need areas with regard to environment, experimentation with materials, tools and techniques, and work practice should be included in the programme. Each activity should lead to production of goods or services. Thus activities may have three dimensions, namely, (i) observation of work situation and identification of problems, (ii) participation in work situations, and (iii) preparing articles in large numbers. The work education activities at this stage should be simple and enjoyable.

At the upper primary stage, learners are sufficiently mature to carry out strenuous work with higher skills requiring closer neuro-muscular coordination. They should be encouraged to participate more intensively in production processes by understanding well designed projects. By and large, the activities should lead to the enhancement in nutrition, personal and community health, sanitation, productivity and economic status of the community. The observation, manipulation and work practice should be the methodology to achieve the stipulated goals. At this stage, the learning and mastery of skills become more important than at the primary stage. This is the age when work education should emphasise agricultural and technological processes to help the integration of science, mathematics and technology with the life of the community. Work education should prove to be helpful to the learner on his/her entry into the work force.

At the secondary stage, the nature of essential activities will remain more or less the same as during the upper primary stage with the difference that they will be more complex. Work practice should assume a much greater dimension, and a clear pre-vocational orientation should be given to the programme, so as to facilitate the choice of the vocational courses at the higher/senior secondary stage for those who opt for them after passing the secondary stage. Pupils in general should acquire the knowledge and skills required for entry into the world of work.

It would be most imperative to utilise community resources for the effective implementation of this programme. It will be particularly necessary for providing pre-vocational orientation that the experts from the community are duly involved in the programme. Although it is expected that all teachers should work as work education teachers, a large number of activities may require specialised personnel. The involvement of all teachers in this programme would logically imply their proper orientation and training in this area.

Art Education

Art education should be treated as an important area of curricular activity for all-round development of the child. The aim of art education should be to sensitise the learners so that they may learn to respond to the beauty in line, colour, form, movement and sound. The study of art and cultural heritage may enable them to appreciate and understand one another. The curriculum should aim at developing awareness of, and interest in, a wide variety of fine arts, both at the classical and folk level so that the learner is both the beneficiary and the performer. Art provides a most satisfying medium of creative expression. However, art education and creative expression have not got adequate attention in school curriculum so far.

At the pre-primary stage a variety of activities and games like colour games, drawing and painting, construction play, thematic stories and songs, clay modelling, beautification of surroundings and classroom, music and movements are directed at sensory stimulation and aesthetic appreciation. They should be effectively organised at the pre-primary stage so as to provide joy to children and develop in them a readiness for art education at the primary level.

At the primary stage, the main objective of art education is to make the child aware of the good and beautiful in the environment and to express his/her feelings through simple performing arts like music, dance, drama, etc. spontaneously. At this stage, the main objective of art education should be to enable the child to discover and identify his/her own sensibilities and preferences through exposure to a variety of media and materials and to optimise his/her own capacity in one or more arts. The aim at this stage should be to provide to the child an integrated learning experience of various forms of art – drawing, painting, printing, collage, modelling, music, dance and drama. Emphasis should also be on sharpening the sensibilities of seeing, hearing, touching and moving.

At the upper primary stage, art education programme should comprise (i) handling of the materials for drawing, painting, printing, collage, clay, modelling and construction of puppets; (ii) creating artistic things by free expression method and specific topics method; (iii) handling of simple musical instruments and sound-producing bodies; (iv) movement, mime and simple dance forms; (v) community singing; (vi) simple concepts of visual and performing arts; (vii) stories of great personalities in the field of arts; and (viii) stories connected with other countries. Emphasis should be laid on the use of learner's own imagination and development of his/her own concepts and expression through exploration. He/she should be enabled to develop a sense of organisation and design, i.e. aesthetic arrangements permeating all life, and to feel a deep and lasting joy of art.

At the secondary stage, art education should comprise (i) study of visual and aural resources and their exploration; (ii) projects leading to creative expression and exhibition of the works in visual and aural forms; (iii) inter-group inter-school art activities; (iv) study trips and interaction with artists in the community; (v) exploration of traditional art forms available in the community and neighbourhood. This should also be treated as a transitional period between the creative expression of childhood and vocation-biased education of larger period. Normally learners at this stage also need to develop aesthetic sensibilities and social values through projects on conservation of natural and cultural heritage by providing opportunities for study of Indian culture, working with artists/artistes in the community, organising festivals and celebrations of the community at large, display of physical environment and surrounding landscape, etc.

Art education programme should concentrate on exposing the learner to folk arts, local specific art and other cultural components, leading to an awareness and appreciation of our national heritage. Activities and programmes and themes should also be chosen and designed so as to promote values related to other core components like India's common cultural heritage, history of freedom movement and protection of environment. Learning by doing and a wide exposure to art forms is a must for self-expression and widening of the learner's own experience. Art education should not be fragmented. It should adopt an integrative approach at all stages up to Class X.

Health and Physical Education

Health and physical education and sports should be an integral part of the learning process and be included in the evaluation of performance. Health and physical education should be concerned with the total health of the learner and the community implying thereby the important place of mental and emotional health, in addition to the physical health. Thus it should enable the pupil to know that harmonious development of body and mind is essential for good health. He/she should be helped to develop desirable understanding, attitudes and practices with regard to nutrition, health and sanitation so that the health status of the family and community is improved. Thus, he/she should be enabled to develop awareness also as a conscious citizen about the health and sanitation at the community level and his role in that context. The physical education should aim at developing health, strength and fitness of the body. Acquisition of adequate neuro-muscular coordination should be an important component of the scheme of health and physical education. Some programmes related to physical education, such as scouting, guiding, N.C.C., etc. can be of help in cultivation of such basic qualities as endurance, courage, decision-making, resourcefulness, respect for others, truthfulness, faithfulness, loyalty to duty, and concern for common good. They also promote integrate learning in different curricular areas directly or indirectly and promote the latent curriculum of an institution.

The content of health and physical education during the first ten years should include those areas which are needed for general promotion of healthful living as well as those related to the major health problems of the country. Amongst sports and games activities, due stress should be laid on indigenous traditional games. ***As a system which promotes an integral development of body and mind, yoga should receive special attention.***

Medical inspection and check-up should be compulsory at all the stages with adequate follow-up in cases in which medical/physical defects are noticed.

At the pre-primary stage, development in the child of adequate personal hygiene habits, neuro-muscular coordination, emotional health and healthy community living is an important concern of education. Apart from various activities related to larger and finer muscles, adequate attention is expected to be paid to activities like regular visits to toilet, washing hands before and after meals, brushing/cleaning teeth regularly, taking regular baths, combing hair, keeping self and surroundings clean and the like. Training of senses that should take place at pre-primary stage should be an important component of this area.

In view of the characteristic physical growth, neuro-muscular coordination and social development that take place at the upper primary stage, it is desirable to provide for vigorous developmental exercises, rhythmic, gymnastics, calisthenics, athletics, aquatics, judo, yoga, drill and marching, scouting, camping and various team games and competitions at that stage. In health education, provision should be made for creation among learners of awareness related to common health problems, safety measures, nutritional problems, adulteration, first-aid, sanitation and pollution.

With regard to physical, mental and emotional health of learners, the secondary stage of education is particularly crucial. Rapid acceleration of growth and changes in appearance and functions of the body associated with the onset of puberty indicate the need of provision of appropriate guidance and counselling that would facilitate the adjustment and growth of children. Interests during this period narrow down to fewer games. The pupil is likely to be more adventurous comparatively. Physical education should include more vigorous activities of various sorts including athletics, major games including indigenous games, gymnastics, yogic exercises, combatives, judo and swimming. The NCC and social service should be encouraged in addition to the compulsory programmes of physical education. In Classes IX and X, health education should enable the pupils to learn, in comparatively great detail, about personal health, impact of environmental pollution on health, food and nutrition, adolescence education control and prevention of diseases, consumer education, first aid, home nursing, and safety measures.

2.5.6 Value Education

One of the core curricular components 'Secularism' has so far been interpreted as complete dissociation between education and religion and it has been held that religion being a private and personal phenomenon should be left to an individual and his/her home and the community and should not find a place in the school or curricular materials, although Sri Prakasa Committee appointed by the Government of India observed in 1960 that leaving religious education entirely to home and the community would result in the neglect of ethical teachings and spiritual values. In today's world different communities do not care to know the fundamentals of religions of their own or of others. This unfortunate ignorance of other faiths has bred prejudices and disunity. Therefore an objective, and sympathetic study of all the major religions of India, without their myth, dogma and rituals, should be provided for.

Mahatma Gandhi's views in this regard are most relevant today:

> *"If India is not to declare spiritual bankruptcy, religious instruction of its youth must be at least as necessary as secular instruction... I believe that fundamental ethics is common to all religions... A curriculum of religious instruction should include a study of the tenets of faiths other than one's own. For this purpose the students should be trained to cultivate the habit of understanding and appreciating the doctrines of various great religions of the world in a spirit of reverence and broadminded tolerance".*
>
> *(Young India, 25 August, 1927)*

Moral values, referring to the interpersonal conduct in various situations of coexistence, and spiritual values affecting the individual in his/her relations with himself/herself need emphasis in our education today. Love for one's country without egotistical and chauvinistic hues is the need of the hour and this is one of the spiritual values. Any system of education that does not foster these values in learners is not sound.

At the elementary stage (i) the school assembly should be held for a few minutes in the morning for group singing; (ii) simple and interesting stories about the lives and teachings of prophets of different religions, saints and sacred books should be included in the language curricular materials; (iii) two periods per week may be set aside for moral instruction through various modes; and (iv) through school programme, the attitude of 'service' to humanity and other creatures, even nature and the realisation that 'work is worship' should be developed among learners.

At the secondary stage: (i) the morning assembly should observe two minutes' silence followed by readings from books of wisdom of different religions or great literature of the world or an appropriate address; (ii) the essential teachings of the major world religions should be studied; (iii) one or two hours a week should be used for moral instruction. Suitable speakers may be invited to address students on moral and spiritual values. Joint celebrations of the important occasions/festivals of the major religions should be organised; (iv) social service during holidays and outside class hours should be organised as an essential part of extra-curricular activities. At both the elementary and secondary stages community singing programmes should be organised. At the secondary stage organising National Integration Camps would also go a long way to secure value inculcation in every possible way.

Once this programme is implemented in a balanced and judicious manner, the basic unifying and harmonising factors and principles will be effectively generating understanding of and respect for all the religious of India and create a tolerant cohesive society.

2.6 INSTRUCTIONAL STRATEGY

For effective transaction of the curriculum and achievement of curriculum objectives, appropriate strategies should be used in organising activities for students and in providing learning activities. Instructional strategies may assume a variety of modes and may involve activities such as observation, collection of materials and information, demonstration and experimentation, project assignment, field work, educational excursion, role playing, dramatisation, discussion, debate, problem solving, discovery learning, creative writing, supplementary reading, etc.

A number of factors need to be considered while making use of a particular strategy: learner's capabilities, availability of resources, entry behaviour, school environment, objectives to be achieved, the nature of content and the teachers' own preparation and mastery.

The immediate environment of the learner, both natural and human, should be used for making learning more concrete and meaningful. Teaching aids of various kinds from simple low cost materials to sophisticated technology such as audio-video and computers are available. It is the proper use of an aid, which promotes learning and not all just the sophistication of technology. Effective learning takes place when teachers are able to involve the students in the process of learning, by taking them beyond the process of listening to that of thinking, reasoning and doing.

Receiving regular feedback for teaching and learning should be an in-built component of teaching-learning strategy. Continuous and comprehensive evaluation plays an important role in providing regular feedback. It should be used for improving the weak areas.

Different kinds of strategies should be required for slow, average and fast learners. Diagnostic and remedial instruction should be provided to the slow learner. Enrichment materials and goal-directed teaching-learning strategies would help fast learners.

Non-scholastic areas of learning should be handled adopting appropriate strategies and they be given due importance for developing the child's personality. Several school activities such as morning assembly, cultural and recreational activities, school beautification, activities in community living, celebrations of days of national importance, special days and weeks, and creative activities, may be organised/conducted with proper planning and well-directed goals.

2.7 MEDIUM OF INSTRUCTION

Medium of instruction is a very crucial factor in determining the quality of curriculum transaction and the level of achievement. Only that language can be effectively used as the medium which the learners understand and in which they can comfortably interact. As such, it is widely recognised that the first language is the learner's most natural medium of communication, and, therefore, of instruction. In the case of learners whose first language is also the standard school language/regional language, the medium of instruction at least up to the elementary stage should be the regional language. Thereafter, wherever thought more helpful and therefore necessary, the second language, which incidentally happens to be English in the present national scenario, could be accepted as the medium because by the end of the elementary stage the learners are expected to have acquired fairly satisfactory level of receptive and expressive skills in this language. *In exceptional cases,* in the institutions where the general level of pupils' receptiveness and expressive skills in English is very good at the end of the primary stage, the use of English may be permitted from the first year of the upper primary stage. But this should not be made the norm.

However, in the case of those pupils whose home language/first language is different from the regional language, the regional language may be adopted as a medium only from the third standard onward. In the first two years the pupils' home language/first language should be used as the medium in such a manner that a smooth transition from the pupils' operations in the home language to those in the school/regional language naturally takes place.

The current practice of imposing a new language as the medium on the learner right from the pre-school stage and the primary classes is highly detrimental to pupils' growth, results in unproductive mugging up of text materials which is a heavy load of non-comprehensibility and seriously hampers any attempt at self-learning or self-directed learning. Besides, it also does a serious damage to pupils' progress in and command of their first language which arrests the development of their overall personality. Mahatma Gandhi's observation in the matter needs serious consideration.

> *"The foreign medium has caused brain fag, put an undue strain upon the nerves of our children, made them crammers and imitators, unfitted them for original work and thought and disabled them for filtrating their learning to the family or the masses".*
>
> *(Young India, 1 September, 1921)*

Therefore, till the end of the primary stage, no other language except the pupils' first language should be permitted as the medium of instruction.

2.8 INSTRUCTIONAL TIME

All possible efforts should be made to ensure that the stipulated number of working days are ACTUALLY available to schools for instructional activities. Loss of instructional time due to unspecified reasons should be prevented or minimised through better educational management. After taking into account the number of days required for organising evaluation activities/tests/examinations, school functions, etc. a minimum of 180 days in a year should be available for effective instruction.

It should be impressed upon schools that every subject should be given the recommended number of hours/periods and time allocated for one subject area/activity should not be encroached upon as per the individual or institutional perception of the relative 'importance' of different subjects.

An early childhood centre/pre-school centre should function for three hours a day. A primary school should function for five hours a day out of which four hours may be set aside for instruction. For the upper primary and secondary schools, the duration of a school day should be six hours out of which five hours should be kept for instruction and the rest for the other routine activities. The duration of a class period may be around 40 minutes.

The actual time allocation for different curricular areas at different stages may be worked out at the time of finalising the document in the light of the suggestions/comments regarding the subjects of study.

Chapter 3

Organisation of Curriculum at Higher Secondary Stage

3.1 CURRICULAR PERSPECTIVES

3.1.1 Context and Concerns

National Policy on Education (NPE) 1968 recommended a common structure of 10+2+3 throughout the country and stressed the need for diversification after ten years of general education. The NPE (1986) reiterated the need for diversification and emphasised a *national curriculum framework* and minimum learning outcome as essential ingredients of the national system of education. 10+2+3 structure is now a reality but national system of education which envisaged some elements of curricular uniformity throughout the country is yet to be achieved. Due to country's vastness and diversities, perhaps this is not going to be an easy task although desirable. In today's world where many countries (developed and developing) are talking of their *National Standards* in education, we cannot afford to ignore country's *national standards* which should be comparable to any international standards. The *standard* to seek at +2 stage is of greater significance since it is at this stage that from general education of secondary stage, students gradually move towards diversification and offer specialised academic courses (of academic stream) on the one hand and job oriented or productivity oriented courses (of vocational stream) on the other. It is this stage when a student is in position to exercise a choice of stream/course in keeping with his/her own needs, interest, capability and aptitude while preparing to cope with the future.

For majority of the students the higher secondary stage may prove terminal. For them it would serve as a doorway to life and more importantly, to the world of work. For others it would be bridge to the tertiary stage of education, professional courses (engineering, technology and medical etc.) or academic courses, as the case may be.

3.2 HIGHER SECONDARY – A STAGE OF TRANSITION FROM ADOLESCENCE TO YOUTH

The higher secondary stage deals with the human being at a sensitive stage of transition from adolescence to youth. At this stage, learners' interests and aptitudes begin to crystallise and stabilise which have a potential to shape future occupational status of the learner. A feeling of anxiety also begins to haunt him/her. At this stage guidance and counselling should go a long way in sorting out such problems which in no way are unnatural.

An important feature of this stage lies in the fact that it is a transition from general and undifferentiated curriculum to courses of specialised nature. Therefore, curriculum at this stage has a hangover of general education and the challenge of specialisation characteristic of the tertiary education. Change is the watchword at this stage of life. In order to equip these youngsters to cope with change in life it is essential that our *cultural and ethical values* are appropriately stressed and carefully cultivated. A sense of belongingness to the society and the country at large ought to be nurtured to avoid feelings of rootlessness and alienation from the society.

3.3 HIGHER SECONDARY STAGE AS STAGE OF MAXIMUM COMPETITION/CHALLENGE

Today's world is not the same static phenomenon of ester years. The knowledge has been exploding at an unbelievable pace. There is a tough competition in every sphere of life including education, especially after +2 stage. Learning is not confined to classroom only. Trend for de-schooling has taken a root in the system which should be de-rooted immediately for healthy growth of the school system. Fast growth of electronic technology and mass media has added another dimension of learning. Use of TV, computer, internet and multimedia for educative and other purposes is unprecedented. The emerging capabilities in instant storing and retrieval of information have given a boost to self-learning. These have become assets for those who can afford them and have aptitude for learning. Also, gaps between institutions which have these facilities and which do not have is also widening. *Equity with excellence* is no more valid in such situations. There is perceptible change in socio-educational climate of the country. Emergence of a growing affluent middle class eager to spend money for good education to their wards, has added another dimension to the total teaching-learning scenario and also a sort of challenge for those who cannot afford to do the same. It is an accepted fact that those who can afford to send their wards to private coaching institutes are probably in position to stand in the present days' competition. This has shaken the very foundation and philosophy of school education and has thrown a challenge before all of us. Therefore, this is the high time when we should look in totality and strengthen foundation of school education and at the same time provide all those necessary quantum of learning experiences as are needed for providing *diversity* and *flexibility* in school system and promote a appropriate linkage between higher secondary and tertiary levels. While the top leadership will be provided by a small minority, to be groomed at the tertiary level, in every department of life, the second or intermediate level of leadership on a much wider scale will have to be provided by the products of the higher secondary stage. They are expected to make a meaningful contribution to our developmental efforts in agriculture, industry, business and various other social services. The wage employment in the organised sector which is available only to about 15% at present is not likely to increase appreciably. Hence, the products of this stage must be fully equipped with basic knowledge skills, attitudes and entrepreneurship so that they can qualify themselves for self-employment as well.

3.4 ACCESS AND EQUITY

While accepting the goals of diversification and flexibility as indispensable at the higher secondary stage, we cannot afford to ignore the basic parameters of equity and excellence so emphatically stressed by the National Policy on Education (1986). Special care needs to be taken of institutions located in rural and tribal areas and the students therein, by putting in special inputs. The price is none too big for a society that believes in promoting egalitarian values and reduction in the existing disparities. Our Constitution also provides for positive discrimination to see that the neglected and weaker sections of the society are brought into the mainstream of our national life enabling them to make their effective contributions to the harmonious development of an egalitarian society.

3.5 QUALITY IMPROVEMENT

There is a need to identify various ingredients and variables that ultimately determine the quality of education and its end product. Well thought out courses of studies, detailed curricular outlines, identification of learning outcomes, variety of instructional materials both audio and visual and improved evaluation tools will have to be developed. Special teachers will have to be provided for promotion of physical education, sports, arts and aesthetics and vocational courses. And yet all this may not be enough. It is the process of curriculum transaction both in and outside the class that will have to be carefully looked into. The teacher will have to play a catalytic role, entirely different from what he or she is used to, at the moment. A teacher will have to plan learning opportunities more meaningfully and imaginatively in which students are encouraged to learn individually, in small groups, from one another and from the society and environment at large. It is the acquisition of learning skills, ability to explore, observe and discover the unknown and facility in analysis, synthesis, critical thinking and decision making that need to be the watchwords of curriculum transaction under the supervision of teacher who should essentially, be a facilitator of learning.

3.6 DIVERSIFICATION AND FLEXIBILITY

To meet the varied needs and potentialities of an adolescent, diversification and flexibility should be the major characteristic of higher secondary curriculum. Since interests and aptitudes of the pupils stabilise by the time they reach this stage they should be provided opportunities to pursue courses of their choice keeping in view their inclination and preferences. In the context of the rigidities that characterise our education system, for instances : non-availability of choices which cater to individual differences and interests and lack of opportunity to move at one's own pace, it is suggested that content of courses may be made flexible to the extent possible. However, a common programme of studies (core curricular components) cannot be under-estimated.

Courses at the +2 stage, will fall into two broad *streams* – namely, *academic* and *vocational*. As far as possible, there should be some provision for mobility of students from one stream to the other, particularly, during the first few months on the basis of his/her previous attainments. A student wishing to change his/her stream/subjects, should have the facility to undergo some *bridge courses*.

In each of the broad *streams* there should be a judicious mix of some minimum common or un-differentiated curriculum and fair amount of specialised courses. The former will ensure the extension of general education component while the latter can provide for specialised job oriented courses or act as a foundation to academic or professional courses to be taken at tertiary level.

The existing groupings like arts, science, commerce, and agriculture should not be treated as watertight compartments. Students should have the freedom, within practical limits, to offer courses simultaneously from more than one group according to their needs, interests and aptitude. Over a period of time the mental inhibitions setting barriers between academic and vocational and between various traditional groupings can be dismantled.

3.7 OPEN LEARNING SYSTEM

Schooling and education are no more treated as synonyms. In the age of learning societies a new concept of "life long education" has come to say. 'Continuing education' is increasingly becoming not only popular but indispensable to cope with changing technologies and life styles. If the rapid advancement of science and technology has succeeded in extending frontiers of knowledge, it has also provided new tools and techniques to learn at ease, at one's own pace, place and at a time convenient to oneself. Radio, television, films, filmstrips, audio and video cassettes, tape-recorders, video cassette recorders, video cassette player, computer, internet and press are only a few examples, which have tremendous potential not only for mass communication but also for individual instruction. As a result open school and open universities have opened up new vistas to spread and provide education. This alternate system of *open learning* or *distance education* should not be ignored because of our biases and prejudices. Through appropriate infrastructure of correspondence courses, backed with contact centres, provided with other learning facilities, *we can ensure parity of standards between the formal and distance learning systems.* Any systematic effort to evolve curriculum at the +2 stage should not preclude the possibilities of its use in this new alternate channel of education. In fact, the advocates of both the systems should come forward and work towards curriculum enrichment to the mutual advantage of both. *Through a distance education mode a student can rejoin the formal system of higher learning if there is compatibility between open-learning curriculum and formal learning curriculum.*

3.8 SEMESTERISATION OF SENIOR SECONDARY STAGE

The National Policy on Education (1986) has recommended adoption of semester system from the secondary stage onwards. Introduction of semester system was advocated with a purpose of ensuring greater flexibility and functionality among the courses to be offered at +2 stage. Perhaps the greatest point in support of the semester system is the freedom it offers in experimenting with more *satisfactory tools* and techniques of evaluation in general and learning outcomes in particular. It takes us more closer to the universal belief that evaluation should be both comprehensive and continuous. It should be more of formative and corrective in nature than mere summative and judgmental as in the case today.

In this direction, NCERT initiated discussion with COBSE and State Education Boards quite sometimes back (1991-92) and brought out its draft document entitled *Higher Secondary Education and Its Vocationalisation,* as a part of its effort for implementation of 10 + 2 pattern of school education. This document dealt with question of semesterisation particularly in the context of vocationalisation of post secondary education.

Semesterisation has been often discussed and recommended in India, but it has been implemented only in an insignificantly small number of institutions, that too dealing only with higher education. In the most of the cases a year's course has been arbitrarily divided in two parts for being covered in first and second half of a academic session. For each one of the two parts, name of semester course have been given, even though it does not specify the criteria of semester course. Earning and accumulating credits for obtaining a degree/ diploma are also only followed by advanced institutions of higher learning. The interaction with academics working in responsible positions in the universities and in school system has revealed that the following causes underlie the non-implementation of this often advocated reform in curriculum and evaluation.

- lack of conceptual clarity about semesterisation
- natural reluctance as well as resistance to introduce something new
- inability to make academic and administrative preparations
- physical dimensions of holding more examinations by the examining agencies, and
- financial implications

NCERT organised three conferences on semesterisation of school education in collaboration with COBSE and different Boards (CBSE and State Boards). During the conferences following three issues were undertaken and deliberated upon

- conceptual aspects of semesterisation

- operationalisation of the semester system at secondary and senior secondary stages
- evaluation in the semester system in the context of examination reforms.

Aims of semester based education are as follows :

- formulate convenient units of learning and to make a quantum increase in educational standards
- initiate and sustain a process of modernisation and improvement in teaching-learning process
- provide flexibility in the choice of courses to suit the individual needs and interests
- bring reform in the techniques of evaluation
- promote inter-disciplinary approach and studies
- promote internal evaluation by the teachers teaching the course.

Semester corresponds to 15-17 calendar weeks which comes round about 90 to 100 teaching days (excluding examination period). At higher secondary level, two years course will be divided into four semesters.

3.8.1 Credits

Semester pattern of education is modeled on *credit system.* Each course in a semester carries a number of credits depending upon the quantum of work required to be done at time required to be spent on it. Credits usually connote the number of contact hours in class per week throughout semester in the form of lectures, tutorials and seminars. One credit course normally implies class instructions of 50 to 60 minutes supplemented by 2-3 hours of study at home per week throughout the semester. In a lab work and field study, one credit course implies 2-3 hours of work per week throughout semester. Usually semester courses carry 2-4 credits each.

A student earns credits in a course after he/she has

- Attended the minimum number of prescribed lectures including tutorials, seminars, etc delivered or practicals including lab. fieldwork conducted.
- Obtained not less than minimum percentage of marks or qualifying grades reserved for internal assessment.
- Obtained not less than the minimum percentage of marks/grades reserved for semester examination in that course.

A student moving with slow pace or studying part time may spread out his/her study over several hours whereas a brilliant student may take more courses and earn additional credits than normal prescribed for a semester.

Following are the essential concomitants of semester pattern of education:

1. ***Restructuring of Courses*** – The main thrust of semester will be based on restructuring of curricula and courses so that these may reflect the general

objectives of education as well as specific objectives of teaching each course included in the curricula.

2. *Proper Instructional Techniques* – There has to be a decisive shift in the educational endeavour from teaching and teacher-oriented education to learning and students learning orientation. New and dynamic techniques including electronic media have to be adopted with a view to inculcate among the students a sense of curiosity, encouragement for self-study and encouragement for problem solving abilities. Since emphasis has to be on learning rather than on teaching, therefore, seminars tutorial assignments, problem solving sessions, group discussions, lab work, project work and home study will constitute parts of instructional programmes and a credit for each activity will be given in continuous sessional evaluation.

3.9 CURRICULUM ORGANISATION

After going through a common programme of studies, primarily of scientific literacy, basic mathematical skills, cultural heritage of the nation, issues relating to political, economic and social life and environment etc., the stage is ripe for exposing the students to differentiated and specialised in-depth courses in humanities, social sciences, commerce and the like on the one hand, and a variety of vocational courses on the other. Thus, the curriculum at this stage is organised under two streams, namely, *academic stream* and *vocational stream.* However, there is need to ensure that appropriate linkages between the two streams are not only maintained but systematically strengthened.

3.9.1 Academic Stream

Objectives of academic courses at this stage should be as follows:

(i) To expose learners to higher levels of knowledge in different disciplines.

(ii) To introduce students to different ways of collecting and processing data and information under specific disciplines and help them in arriving at conclusions and generating new insights and knowledge in the process.

(iii) To promote problem solving and creative thinking abilities in the citizens of tomorrow to cope with changing demands of a society committed to use science, technology and informatics to alleviate poverty and to raise quality of life of general masses.

(iv) To assist students to explore their interests and aptitudes in order to choose *appropriate careers* in shaping their future.

3.9.2 Scheme of Studies

As stated earlier, diversification is the major characteristic of higher secondary school curriculum. But the movement from general education to diversification has to be gradual. Therefore, some amount of general education will continue to be impart alongwith diversified courses at the higher secondary stage. Thus, the curriculum at this stage will comprise; (i) common foundation courses, and (ii) elective courses.

3.9.3 Common Foundation Courses

Every student entering Class XI has a fair amount of acquaintance and facility with language (generally three), social sciences, science and mathematics, work experience, health and physical education and art education. At +2 stage the element of general education is to be kept to its minimum by incorporating in curriculum only a few but highly significant elements.

The common component of curriculum at this stage would consists of: (i) language and literature, (ii) general studies, (iii) work education, and (iv) health and physical education.

Language – Objectives of teaching language at +2 stage as a scheme of general studies is:

To nurture among learners advanced communication and negotiation skills, higher order reading, writing and study skills and a humane, appreciative and futuristic approach to life and its various manifestations :

(i) Whether a student is preparing to enter life (the world of work) or moving upward to higher academic or professional courses or vocational stream, the study of language in its general and specialised form equips him/her with effective communication and negotiation skills, higher order reading, writing and study skills and a thorough vision of his/her field of study or work. The study of language prepares a learner both to learn and use language effectively in the classroom, the community and the workplace.

(ii) The different texts in the language course materials broaden a learner's mental horizon, liberate him /her from prejudice, dogma and superstition and foster in him /her the desired personal and social values, an awareness of and pride in the great artistic, literary and cultural tradition of the country and a deep understanding of the social psyche of the nation. The study of language/literature would ensure better mental health for the learners through exposure to finer human emotion, sentiments, mental conflicts and their resolution.

The choice of the language to be studied at this level under the Foundation Courses should be left to the learner's personal preference and perceived needs. While the importance of one's first language/regional language cannot be denied as it is the basic cradle for one's mental, psychological, emotional, moral and aesthetic development, English, the vocational language of today and tomorrow, the language of internet and one important repository of world wisdom has its own claim. The choice must lie with the learners.

General Studies – Education is expected to help the students of today to face the challenges of tomorrow with a degree of confidence. It is essential to equip them to face problems of social change and transformation. In fact they must not only face them but also anticipate them. They also need to be made aware of *national and global concerns.* It is in this context that a general studies course is conceived as yet another component of common curriculum. The basic purpose of such a course is mainly to sensitise the youth to the social, economic, political and moral or ethical issues of contemporary India and the world.

The course in general studies to be built on the foundations already laid during the first ten years of schooling. It may encompass some of the ten core elements identified in the National Education Policy 1986 but it should also go beyond them. However, the treatment at this stage should be more analytical and critical so as to develop insights in combating problems of corruption, socio-economic disparities, religious fundamentalism, superstitions and fatalism, various forms of male chauvinism and the like. On the positive side the spirit of tolerance, co-operation, productivity consciousness, entrepreneurship and futuristic outlook should receive special attention. This should also serve as a springboard to discuss global problems like international peace, co-operation, human rights, disarmament and the like. The study should be problem oriented in which local events episodes experiences and examples may also find place. It could be dealt with even in the form of projects in which data could be collected through different sources and analysed for arriving at meaningful conclusions and for developing plan of action, participatory and interactive mode of discussion and discovery approach should be the pedagogical watchwords. Every effort should be made to see that the study of this course does not degenerate into bookish discourses and reproduction of more statistics. Value clarification and inculcation should be the ultimate test of general studies.

3.10 WORK EDUCATION

The final shape of emerging India to a large measure, will be decided by the work ethic we are able to develop in our schools. Our philosophy and attitude towards work, our efforts to develop skills and healthy work habits, and our resolve to improve productivity in every walk of life would depend to a large extent on the place we would assign to work education and work experience in our schools, in and outside the classroom. This explains why work education finds a place in the common curriculum at the +2 stage.

The work education at this stage may be treated as linear extension of *prevocational programmes at the secondary stage,* wherever possible the work education programme may be linked with one or more subjects. It may be independent of subjects as well, if necessary. Special efforts, however, may be made to establish linkages with the subject areas and more particularly with local environment and developmental activities in the neighbourhood. Taking up of long term developmental projects in a village or city slums under the auspices of the school would provide practical experience and insights into special matrix and economic problems and processes. It should help in imbibing specially desirable values. Developmental projects can be adult education, afforestation, road building, and the like.

3.11 HEALTH AND PHYSICAL EDUCATION

Health, which can be both physical and mental, is primary wealth in life. Healthy mind can be found only in a healthy body and as such health and physical education must be perceived as an integral part of common curriculum at any stage of education not excluding the +2 stage.

Apart from regular physical training, athletics, games, sports and physical fitness should receive due attention at this stage as a part of physical education and physical culture. Improvement of local sanitation, and public health services should form part of field work be taken up as part of the course work, personal guidance and counselling need to be provided to students passing through the critical stage of physiological transition in their life.

3.12 ACADEMIC ELECTIVES

Elective courses to be provided at this stage will have cater to the varied and heterogeneous clientele. While quite a few may be preparing for entry into tertiary education, many more would be preparing to enter the world of work. As such, courses at this stage would be essentially of two types, namely academic and applied. A judicious combination of the two should be ideal.

The planning of traditional courses in well established disciplines has its own place. To the list of these conventional courses are now added those courses which have emerged as full-fledged disciplines at the tertiary level. If history, economics, physics and chemistry could be cited as examples to the former category the courses like, computer science, geology, management, administration, etc., can relate to the latter. Provision of such newly emerging sciences at this stage is a welcome change. However, the real challenge for educators lies in identifying and planning courses of applied nature that may have greater employment potential or immediate and direct utility in life. Equally important challenge lies in planning courses which are essentially inter-disciplinary in nature. Perhaps, the potential areas like environment education, conservation education, consumer education, legal literacy, productivity education, population education and family life education, could be explored fruitfully.

A student would be required to offer three elective courses out of the subjects prescribed by the Board of Secondary Education. The list of courses may include modern Indian languages, classical languages, english, physics, chemistry, biology, mathematics, computer science, geology, history, political science, geography, economics, sociology, psychology, philosophy, fine art, sculpture, instrumental music, vocal music, home science, commerce, management, business studies, engineering, drawing etc. The list is not exhaustive. It would be essential to review the list of courses periodically in collaboration with various interest groups, such as industry, business, universities, employment and manpower specialists and common people represented through parents, social workers and political representatives for effecting meaningful changes in tune with the changing needs of the society and that of the individual. The Generic Vocational Course (GVC) meant for the pupils of general academic courses into across various vocations and aims at developing employment related generic skills needed by an educated work force regardless of the persons' occupations. It would improve the quality of general education by developing key competencies/transferable skills for the technology oriented society.

It is a common practice with the Boards of Secondary Education to put elective courses under groups like science, commerce, humanities, etc. But it would be more appropriate to put all the academic and applied courses in a single list without dividing them into watertight or exclusive groups which may at times run contrary to the spirit of real diversification and functional utility. This will help in promoting inter-disciplinarily.

Languages Under Elective Courses

i) Modern Indian Languages – Advanced courses with balanced components of the elements of language, grammar stylistic features, elementary literary theory and some samples of the main literary forms may be provided for those learners who would go in for the study of the language/literature at the university level. Even for those who would not go to the university, the course would be self-contained.

ii) Classical languages – Courses in classical languages like Sanskrit and Arabic would also contain balanced components of the elements of language and philology, grammar, stylistic and compositional features, basic history of literature in the language and some representative samples of the prominent literary masters. These would provide the learners understanding of traditional wisdom and classical literature that would smoothly lead one on to advanced study of these languages/literature the university level or through the non-formal mode.

iii) English – Two different kinds of courses in English may be offered at this stage:

- Academic English Course – At this stage the Academic English Course may aim at enabling learners to be fully equipped for study English language and/or literature at the university level of even teaching English at the elementary stage after undergoing a teacher training course. The course should consists of some basic formal grammar, the elements of English language including basic phonology, advanced level writing and reading skills, introduction of the main literary forms and detailed study of some selected samples of these of an appropriate level.

- Specialised English Courses – Some of the learners may not pursue academic studies after class XII. They may either enter the world of work or join some professional course like the medical, engineering, architecture or management course. These learners will require specialised vocabulary and structures relevant to their work or field of specialisation. For them specialised English courses like 'Business English', 'English for Science and Technology', 'English for Communication' etc. may be prepared which may contain a reasonable amount of literature and the specific linguistic content including vocabulary and structures in a balanced manner. Learners may be free to select the course as per their personal needs.

3.12.1 Weightage for Different Curricular Areas

Assigning a suitable weightage to different curricular areas in terms of allotment of school time is very essential to plan and design a balanced curriculum. Assuming that the school time in a Higher Secondary School is divided into 40 class periods per week, allocation of time for different areas of study may be as under:

Areas of Study	Time Allocation		Credits
	Percentage	Period	
1. Language (One language)	12	5	20
2. General Studies	10	4	16
3. Work Education	8	3	12
4. Health and Physical Education	10	4	16
5. Elective Courses - (3) (Second language may be offered as an elective)	60	24	96
		40	**160**

The above mentioned distribution of time is just suggestive and may be suitably adjusted by Boards/Schools, if necessary. Regarding credits, one credit has been arbitrarily assigned to a course taught for one period per week in a semester. An alternative system may be evolved by the Boards of Secondary Stage.

3.12.2 Vocational Stream

The term vocational education has a comprehensive connotation. Its primary concern is to study technologies in a practical manner. Therefore, it focuses on acquisition of manipulative and other skills facilitating the process of production. For this purpose, it encompasses the study of elements and principles of science on which the specific technologies are based. Going a step further it also attempts to develop desirable attitudes and values relating to occupations in various sectors of economic and social life. Thus it heavily banks on general education both as its base and a continuing support system.

Delors Jacques in his report 'Learning – The Treasure within' (a report of International Commission on Education for twenty first century, 1996) describes 'The Four pillars of Education' – 'Learning to know', 'Learning to do', 'Learning to live together' and 'Learning to be'. 'Learning to do' addresses essentially to vocational education and training. Universalisation of vocational education thus becomes an essentiality. It would, not be out of context to mention that 'vocational education for all' has become the central focus of the world today. Today we all realize that for sustainable development participation of one and all as productive members is indeed necessary.

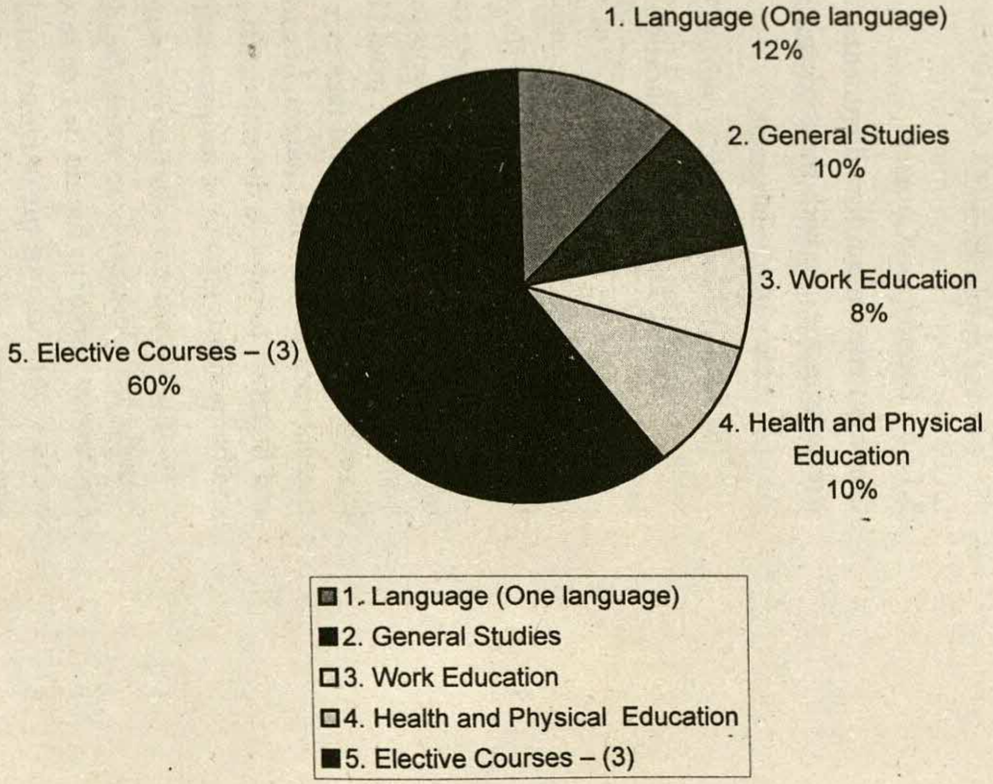
At the higher secondary stage, the Vocational Education Programme (VEP) aims to develop higher skills and related knowledge required by a specific occupation or a group of occupations, through diversified vocational courses to prepare pupil for the world of work, especially for self-employment. It should provide employment in production and service oriented courses to reduce the mismatch between the skills acquired by pupil with those required by the employee/market, thereby reducing the aimless pursuit to higher education. The programme should also help in developing entrepreneurial spirit, motivation and competencies needed to organise and run an entrepreneurial venture. The component of Environment Education and Rural Development should be activity based and should develop awareness about desirable healthy living practices, safely measures at home and work place, sustainable development, rural environment and community participation.

The Vocational Education Stream was started more than two decades back in this country and a substantial progress in this direction has been made. During this long period, approach and focus has undergone a major change, however basic objective of the vocational courses are remaining the same. The vocational education courses need to be based on techno-economic surveys.

Following should be the specific objectives of vocational education at the +2 stage.

i) To meet the need for middle level skilled manpower for the growing and newly emerging domains of the economy, in both the organised and unorganised sectors.

WEIGHTAGE FOR DIFFERENT CURRICULAR AREAS



ii) To contribute to socio-economic development in general and national productivity in particular.

iii) To help reduce growing pressure on tertiary education by diverting a sizeable portion of student population to this more productive mode of education.

iv) To promote national development by enhancing dignity of labour promoting healthy work ethic and reducing unemployment particularly among the educated.

v) To develop a spirit of self help, self-reliance, enterprise and entrepreneurship by preparing the youth for self-employment, in addition to wage employment.

3.12.3 Foundation Courses

Common curriculum for all students would be as much part of vocational stream as in the case with the academic stream. It would include

(i) Study of one language,

(ii) General foundational courses,

(iii) Health and physical education.

The reason for formal exclusion of work experience is obvious since in practice it would receive much more emphasis in the elective vocational courses and in the specific provision for on-the-spot training.

The study of languages would take care of communication skills which in no way are less important for students pursuing vocational courses. The only, but highly significant, difference would be in organizing the language courses in such a way that they would take care of additional vocabulary peculiar to trade or vocation, of each student. In addition there would be units on culture and literature to cater to the emotional and intellectual growth of the learner and harmonious growth of his personality.

In this stream two alternative courses should be provided in General Foundation Courses. One would be the same as in the academic stream. Alternately a student should be free to opt for another course in foundation courses comprising units from rural development, entrepreneurship, environmental education, career development, economics, finance and the like. The students of the academic stream should also be allowed the option to choose the alternate course specifically designed for vocational stream students, if they so desire. Generic vocational skills will be quite appropriate for academic students.

3.12.4 Vocational Electives

Before identifying a vocational course and outlining its details, it would be desirable to ascertain its need, relevance and potential. A vocational survey is undertaken in the catchment area of the school and/or in the district, where necessary.

Once a broad vocational area is identified a systematic job analysis would be the next step to follow. It will be done in terms of the functions and tasks expected to be performed by a worker. Hence every vocational elective course will consist of theoretical aspects or basic scientific principles and the practical operational details based on the same. It would also indicate related values to be inculcated and attitudes to be developed. A course would be developed in terms of a self-contained module specifying expected entry behaviour and learning outcomes.

A component of on-the-job training or apprenticeship should be incorporated as an integral part of curriculum planning and implementation. Advantage may be taken of legislation on the subject in each state. Where such legislation is yet to take place, efforts may be made to expedite the same.

A broad common format may be adopted for outlining vocational courses in various areas. Every care should be taken to ensure their comparability among themselves in terms of load or weightage. But more importantly their comparability with similar courses in other states should also be kept in view for ensuring uniformity of national standards and a more practical consideration of equivalence throughout the country. Any laxity in this regard would be counter productive as below standards courses may lose their credibility harming the interest and mobility of the worker.

Currently, the syllabi of vocational courses of various states are not classified uniformly. It would be desirable to follow a uniform pattern in this regard as suggested below:

- Agriculture
- Business and Commerce
- Health and Para-medical services
- Home Science/Home Economics
- Humanities (Miscellaneous such as Library Science, Instrumental music, Hindustani music...)
- Technology
- Any other

The list of vocational courses offered in a state should constantly be reviewed and renewed from time to time bringing them uptodate in accordance with changing needs, slants and expectations of standards. A course may be discontinued whenever it outlives its utility and slumps in its demand. The exercise of periodic second look at the courses for their renewal, modification, discontinuation or the introduction of entirely new courses may be taken up in a group consisting of a cross section of employers, educators, administrators and people's representatives. Such policy decisions may then be implemented through the help of expert groups.

The weightage to be given to various components of the vocational courses may be as suggested below:

Areas of Study	Time Allocation Percentage	Time Allocation Period	Credits
1. Language	15	6-8	24-32
2. General Foundation Courses	8	3-4	12-16
3. Health and Physical Education	7	2	8
4. Vocational Electives	70	27-28	108-112
	100		**160**

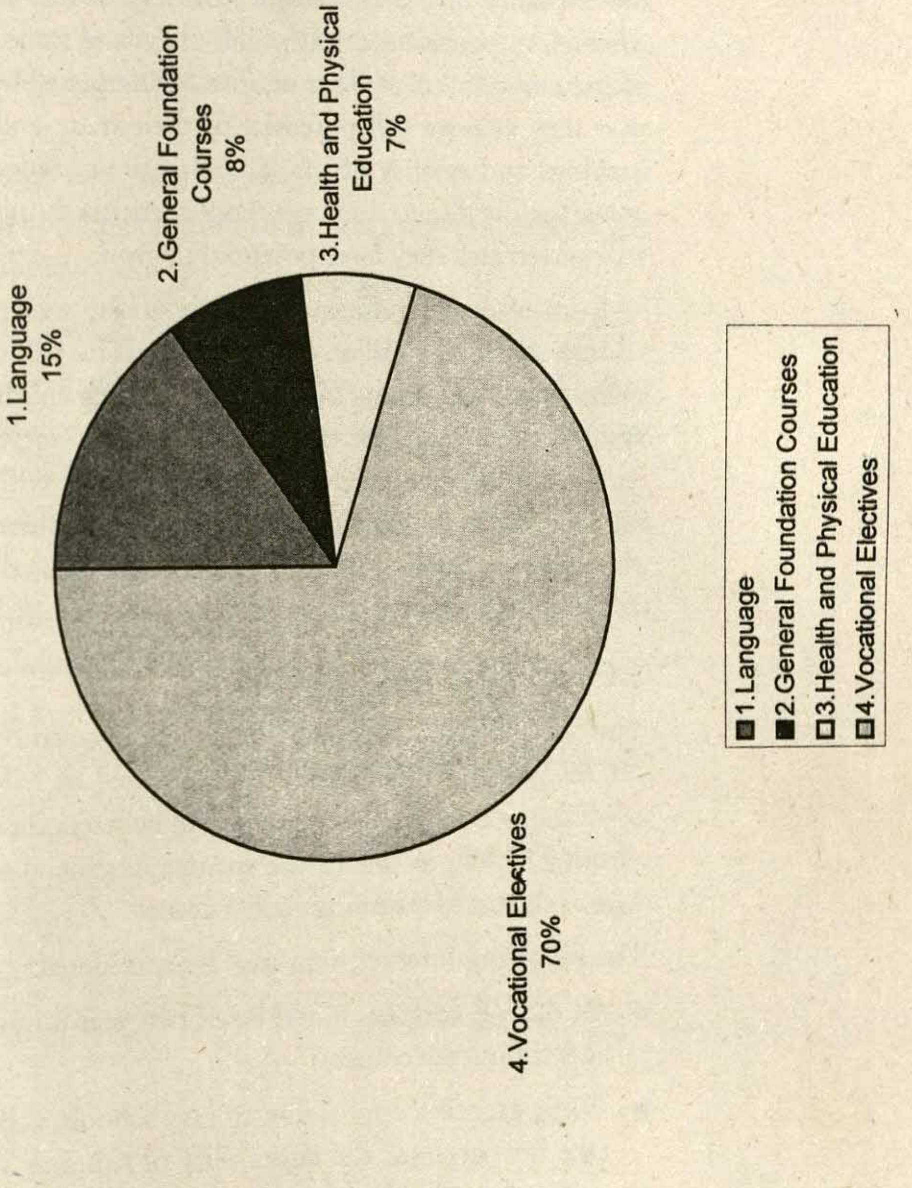
3.12.5 Concerns

The vocationalisation of education at the senior secondary stage of schooling has achieved only partial success. The students have preferences for general courses – science, arts or commerce streams at the +2 level and thereafter they more into general courses at tertiary sector of education. They constitute the bulk of the 60 million educated unemployed youth in the country. The school and college population constitutes 20 per cent of the population. For a large majority of this population sector, school and college education has become irrelevant to the needs of the society. About 85 per cent of the unemployed in the live register of the Employment Exchanges are constituted by the secondary and the higher secondary level pass and not-pass youth. They include school dropouts from all the streams of arts, science and commerce.

The NPE 1986 put the target of 10 per cent diversion of students to vocational streams by 1990 and 25 per cent by 1995. Against this, the Centrally Sponsored Scheme of the VEP has sanctioned enrolment of 0.9 million in over 6000 institutions making the coverage of less than 10 per cent, but the actual enrolment is further lower at 4.8 per cent as per the ORG evaluation report of the scheme. Compare this with the developed countries where 65-90% students join or the other kind of vocational and technical courses right from the secondary education.

The country does require technical and skilled manpower particularly in view of the opening up of the economy in recent years and thrust on liberalisation and globalisation. The working force of the country constitutes 36 per cent of the country's population, of which the organised sector – both public and private – employs only 11 per cent. In a developing economy like ours the workforce shifts from agriculture to manufacturing and then to service

VOCATIONAL ELECTIVES



sectors. Both the sectors require highly skilled manpower for increasing productivity. There are large opportunities for trained manpower in social service sector particularly education and health. In education alone, to achieve the goals of the universalisation, the job opportunities would be available to over two million teachers/para-teachers. As per one estimate, there is hardly 1 per cent working force in health sector in India as compared to 11 per cent in USA.

The traditional Indian way of life has an inherent non-formal system of development of human resource through which craftsmen, potters, weavers, masons, carpenters etc. learn their crafts and trade. The skills and techniques of these traditional artisans need to be sharpened by way of formal training so that they achieve full potential of their trade and crafts and improve their earnings and quality of life. Some of these trades are vanishing from rural areas, mainly due to existing school curricula though their need and relevance still persist and they have potential to grow.

Even after we achieve the goals of the universalisation of elementary education for 200 million children, at least for half of them it will be a terminal education. The existing capacity of absorbing children in the secondary school system is less than one third in the relevant age cohort which may at most increase to fifty per cent in the coming years with more private (also govt.) schools coming in the secondary sector. The children completing the primary/ elementary schooling need to be imparted such education and provided with such skills as will help them live a quality life.

3.13 POLICY IMPLICATIONS

The VE at the +2 stage has been studied by various bodies and latest by the NCERT working group(1998) constituted by MHRD. All the three models of VEP at +2 stage may continue and be strengthened. There are, a +2 school running of VE, as one of the streams in general school and school attached with Industry for running such a course.

The following interventions may be considered :

- All the VE courses should be of two year duration similar to arts, science and commerce courses.
- While granting application to new schools, CBSE and other Boards must take into account the desirability of running VE stream by the school in preference to other streams.
- CBSE and other Boards must attach equal value to the evaluation and certification of the VE stream.
- *A feasibility study* may be undertaken to start VE in all the Kendriya Vidyalayas and NVS schools to send right signals to the schools run by the State Government and private/non-government organisations.

3.13.1 Non-Formal System of Vocational Education

In real situation a large number of children are dropping out from schools, adults are acquiring reading and writing skills and rural artisans and skilled workers – want to upgrade their vocational skills. Persons with disability need to be mainstreamed into the society through vocations appropriate to them. This has now received greater importance after the enactment of the persons with disabilities (equal opportunities, protection of rights and full participation) Act 1995.

Non-formal system may also be used to bring such children in the formal system by imparting suitable vocational training's, the education system running the NFE and adult literacy programme will have to take following policy decisions:

- To make their courses need and vocation based.
- To facilitate VE and skill building projects for school drop outs, neoliterates and persons with disabilities.

3.13.2 General Policy Decisions

Most of the policy decisions fall within the jurisdiction and responsibilities of the MHRD. However, in some cases the decision would require from other Ministries/Planning Commission, such as

- Changing the recruitment rules for considering VE stream as qualification for various jobs.
- Making VE programmes a long term educational strategy and not to be threatened with termination at the end of every plan.
- Establishment of an autonomous council with facilitating role to coordinate all vocational education and training programme being run by various ministries and organisations.

Chapter 4

Evaluation and Examination

Education, in general, aims at shaping the personality of children in the desired direction. It is done through a variety of inputs like curriculum textbooks and other instructional materials, organisation of teaching- learning through direct or indirect contact with children. Other meaningful inputs come from peers, parents, siblings and other interactions with society. Major emphasis is normally given to classroom teaching and on use of prescribed textbooks. It is rightly said that while it matters what is taught, it matters much more how it is taught and it matters still more how it is evaluated. The method of examination therefore determines the method of teaching to a great extent. The aspects on which emphasis is laid in examination only get importance in teaching. So much so that the aspects of curriculum which are not subjected to examination are usually neglected in teaching. Ideally speaking, whatever is taught should be tested. The practice is reverse that whatever is tested is taught. Considerations like this highlight the importance of examination and evaluation. Several efforts have been made to reform the examination system but the success rate has been far from the expected. The public examinations at terminal stages of education which we inhereted as a legacy of British rule continue to dominate the Indian scene and the system of examination and evaluation seems to have eroded the confidence of the people. The ill-effects of examination sometimes force one to believe that examinations are doing more harm than good and they wish to get rid of it or accept them as a unavoidable evil.

There are various aspects of examination and evaluation which need serious consideration before we discuss issues related to it. These relate to certain questions such as:

(a) Do we have well defined levels to be attained by children at the end of a particular stage of education (pre-primary, primary, upper primary, secondary, and senior secondary) ?

(b) Do we have appropriate testing tools/devices to assess attainment of the levels in both cognitive and non-cognitive aspects of development among children ?

(c) Do we have clearly defined roles of evaluators (internal and external)?

(d) Do we have well defined mechanism of utilising the outcomes of such formal and informal assessments ?

(e) Do we have tools of reliable quality and transparent systems for evaluating students' progress ?

(f) Do we have appropriate systems for carrying out mid-term corrections ?

(g) Do we have a well-defined strategy for communicating examination results in a manner the children, teachers and parents can derive meaning ?

(h) How can evaluation be made learner friendly ?

(i) How can the system provide flexibility and liberty to experiment with the evaluation process ?

4.1 THE PRESENT SCENARIO

Evaluation and examination are considered to be necessary requirements for classification, gradation and promotion of students from one grade to the next and sometimes the outcomes of evaluation are also utilised for employment purposes. Although teachers are asked to evaluate the performance of students under their charge, little faith is placed on internal assessment. Internal assessment schemes were employed in the past and had to be withdrawn as they were required to be moderated by external set of evaluators. This seems to be happening mainly because of lack of proper guidelines and taking the whole exercises in a casual manner, not being in a position to thwart various kinds of pressures. Consequent to this, external examinations have been unduly emphasised and reliability and validity of such external public examinations have also been a matter of criticism on various counts. Entrance tests and recruitment examinations have become the order of the day. The significance of public examination results have been reduced to the qualifying levels only. The public examinations have their own limitations mainly because of extreme by low sampling of the content, least duration of examination time, more emphasis on rote memorisation than application, neglect of proper assessment of non-cognitive areas of learning and having limited scope for midterm corrections and remediation. Continuous and comprehensive evaluation has therefore been a far-cry. It is also a fact that the attainment levels for passing a particular examination have been set in the range of 33 to 40% marks. There is hardly any opportunity in the system to make good the deficiency in the required attainment levels. Development of mastery levels amongst learners has been emphasised in the *National Curriculum Framework* (1988). The main problem that can be identified as a root cause of all these inadequacies seems to be non-institutionalisation of continuous and comprehensive evaluation at any stage of school education. Diagnostic and remedial teaching occurs very rarely. To sum up it may be stated that the present examination and evaluation system is lop-sided, impersonalised, non-transparent and incapable of reinforcing proper teaching learning in schools and providing help and guidance for further learning leading to self and self directed learning. There is a need to revamp the whole system of examinations and evaluation from primary grades to senior secondary stage if proper benefit is to be arrived out of precious inputs provided through resources drawn from the country's economy.

4.2 SCOPE OF EVALUATION

Evaluation as carried out today is quite restricted in scope, purpose and utility. Although the educational objectives are formulated keeping in view the all round development of the learners covering both scholastic and non-scholastic dimensions. In practice evaluation rarely goes beyond the scholastics aspects (cognitive development). While curriculum provides for guidelines with regard to the systematic organisation of experiences which may lead to physical and socio-emotional growth and development along with cognitive development of the learners. Non-scholastic (non-cognitive) aspects of learners' growth are not given due emphasis in schools as these are not considered as evaluative entity. Proper specification would need to be spelt out in the ensuing curriculum for each stage of education.

The Education Commission (1964-66) had envisaged the need to define National Standards at three levels, namely, at the end of primary stage (Class VIII), end of lower secondary stage (Class X), and end of higher secondary stage (Class XII). *National Policy on Education* (1986) also re-iterated the same by stating that Minimum Levels of Learning (MLLs) should be identified for all stages of education. Identification of such standards thus becomes the starting point of educational endeavour. Minimum Levels of Learning could eventually be stated in terms of certain competencies encompassing knowledge, concepts, skills, personality qualities such as interests, attitudes, appreciation and values. These standards are required to be achieved by one and all at the level of mastery. However, there should be enough scope within the ambit of the statement of competencies to allow flexibility to students to go beyond and flourish their talent. The second step is to provide ample opportunities and experiences through a variety of activities for formal and informal interactions and organising teaching learning situations to help each child to be able to attain the MLLs and to grow as per his/her potential. The third important aspect is evaluation that should be considered as an integral part of teaching learning. The main aim of such an evaluation should be to ascertain as to how well or poorly a student has performed with reference to:

a) The learners own growth and

b) The criteria/standard set by the teacher.

With a view to providing realistic assessment, evaluation has to be regularly done by employing a multiplicity of techniques covering all aspects of all round development of learner's growth. Evaluation should provide for alternate procedures to cater to the needs of children with special needs. As it has to be carried out throughout the teaching learning process, it should be undertaken in a manner that neither creates burden on children nor should it be taxing to the teacher. Evaluation has to be a regular feature of classroom teaching learning for which informal ways will need to be adopted by teachers. Teachers may be oriented in techniques of evaluation so that they are able to organise teaching and evaluation in a most natural way. Teachers may be given orientation on the lines of SOPT (Special Orientation of Primary Teachers) where pratical training may be provided in the nitty-gritty of evaluation techniques, their use and applications.

No common strategy of evaluation may suit all levels of education. Teachers may be trained to practise differential approach commensurate with the stage of learning. At pre-primary stage there may be emphasis on oral testing and informal conversation which may continue until Grade II. As from Class III onwards an element of written test may be introduced. At Primary stage emphasis should be given to acquisition of competencies amongst children. Upper primary stage may focus on stated competencies along with content. The secondary stage may follow disciplinary approach to teaching and learning of subjects. Both objective and essay type test may be utilised besides practical examinations. Participation in co-curricular activities, games and sports, physical education etc. should be encourage and assessed. Students' participation should also be sought and gradually increased. The journey from evaluation by teachers to self-evaluation by learners has to be carried out if real fruits of education are to be achieved. Teachers will have to be empowered to help expedite this process.

4.3 PURPOSES OF EVALUATION

Main purpose of evaluation as envisaged by the Education Commission (1964-66) and re-iterated in NPE, 1986 is to help determine and gradually raise standards of attainment at State and National levels. Evaluation should therefore be construed as a powerful instrument for improving the quality of education in general that of improving teaching learning in particular. One of the main ingredient of quality education is quality of learners' achievements which should be effectively realised through feed-back mechanism to be employed for the benefit of learners, teachers and parents. Now-a-days evaluation is practised as a mandatory requirement of the system which is accomplished through end of year examinations and some tests etc. during the year. In order to have proper evaluation of learners' progress examination alone should not be relied upon. Other modes of assessment such as observation during individual and group tasks, sociogram and peer ratings etc. may be put to use. The outcomes of this evaluation convey the achievement of students at particular times as revealed through the testing devices put to use. This exercise is done more as a ritual rather than a device of specific feed-back to learners, teachers and parents. Corrective measures particularly in terms of remedial instructions are a rare phenomenon. In order to derive full advantage of examination and evaluation the outcomes need to be interpreted in the following manner :

1. By the learner to know his/her strength and weaknesses and get inspiration to make up the deficiency at the earliest.

2. By the teacher to have an assessment of students performance on one hand and assessment of the efficacy the teaching learning strategy employed by him/her. This should be analysed with a view to providing differential treatments to different categories of learners so that students may be engaged as under:
   (a) Bright ones may be engaged in goal directed learning through enrichment programme.
   (b) Average ones may be involved in peer learning by assigning specific tasks in small groups.
   (c) The weaker ones may be diagnosed properly and remedial teaching may be organised before embarking upon new teaching units.

The aforesaid practice of evaluation will constitute part of continuous, periodic and comprehensive evaluation and may help learners attain mastery of competencies, basic skills, desirable attitudes and values which may help them to settle in life and become good and contributing citizens of the country. Necessary steps may be taken to reduce the element of rote memorisation of information from books to application of the learned concepts, skills and competencies in practical situations. Besides this the textbooks, instructional materials will have to be re-oriented towards this goal, teachers will have to be motivated and empowered to undertake such tasks in right earnest. Need for a serious monitoring mechanism cannot be undermined.

4.4 ATTAINMENT OF MINIMUM LEVELS OF LEARNING (MLLs)

Minimum Levels of Learning were put to use at primary level in 1991. Countrywide projects were launched which yielded encouraging results on one hand and helped identification of hard spots of learning on the other. The concept has been utilised by the States including the ones which are implementing DPEP programmes. Curricular materials such as textbooks, workbooks, teachers' guides have also been prepared. There have been efforts to revise the MLLs at primary stage and to develop MLLs for upper primary stage. Inspite of these developments MLLs could not remain criticism-free. While attainment of MLLs at mastery level has not been achieved by a sizable population of students, there has been a section of people, making demand for pitching MLLs still higher. There seems to have been a major problem of communication gap with regard to the meanings derived differently by different set of people about the concept and strategy of MLLs. What is desirable is that a clear-cut explanation in terms of consensus version should be evolved and widely circulated throughout the length and breadth of the system. Non-cognitive areas need to be suitably spelt out in achievable forms and should constitute part of the total strategy for qualitative improvement of school education. Once the MLLs are clearly defined suitable experiences should be organised by the school to help achieve them at the level of mastery. This can be achieved by accepting MLLs not only as a concept but an approach which may have the following in-built into it:

1) Mastery learning strategy
2) Child centred and activity based teaching (imbibing the elements of contextuality, learning from environment and the joyful learning).
3) Continuous, periodic and comprehensive evaluation.
4) Differential treatment including diagnostic and remedial teaching, peer learning, goal directed learning (enrichment) and self-learning.
5) Action research
6) Flexibility.

4.5 TOOLS, TECHNIQUES AND MODES OF EVALUATION

Tools, techniques and modes of evaluation play an important role in proper evaluation of students' performance. Ideally speaking, every teacher should be trained in:

1) Developing necessary tools to be used for achievement of learners in cognitive and non-cognitive areas,
2) He/she should be able to select appropriate tool and technique out of the available ones, and
3) He/she should be competent to employ a right technique or use an appropriate tool or mode to assess the performance of the learners, making suitable judgements and deriving feed-back for improvement of instructions.

These competencies can be expected among teachers if proper care is taken through pre-service and in-service training programmes. Teachers should also be trained in communicating the results to parents and students in a meaningful way. The principles of relevance and flexibility should be applicable to evaluation of the attainment of the learners as these are applied to development of curriculum and its transaction.

There is need to place emphasis on deformalisation of both internal and external examinations with a view to reducing the anxiety and fear experienced by the learners at all stages of education. Play-way activities and informal modes of evaluation should characterise primary education. Formal methods of course should be gradually introduced as from Class III onwards. More use of oral testing should be made to assess the development of basic skills in language, numeracy, health, nutrition and sanitation. The outcomes of oral testing should also be recorded, interpreted, communicated and feed-back derived out of them. Similar efforts should be made to record evidence regarding development of personality qualities, psycho-motor skills and non-scholastic areas such as work experience, art education and physical education.

These efforts should culminate in developing profiles of growth of development of every learner and this should be mandatory for each and every school to maintain such profiles. The existing system of written tests and examinations needs thorough change on the following counts:

1) It should be competency based
2) It should help evaluate all aspects of learners growth (cognitive and non-cognitive)
3) It should give least importance to memorisation and more and more emphasis to understanding, skills, application and creative aspects.

4.6 MAINTENANCE OF RECORDS AND REPORTING

Practice of positive reporting should be encouraged so that the youngsters do not feel condemned. However, suggestions should be made for their improvement on the basis of proper diagnosis of the weaknesses of learners. Records should be maintained for both cognitive and non-cognitive growth and development of learners. The best way would be through preparing the profiles as suggested earlier. The results should be communicated to the parents on regular intervals of time and each time the progress of the learner should be reviewed with a view to deriving corrective measures for further improvement.

4.7 NON-DETENTION POLICY AT PRIMARY STAGE AND EVALUATION STRATEGY

Non-detention policy was advocated and recommended with all sincere wishes not to subject young children with a trauma of failure and dejection. But in practice it has been used as a tool for promoting children without ensuring any levels of competence among learners. Net result is that children coming to upper primary stage lack basic literacy and numeracy skills. In most of the States it has been linked with 60 per cent of attendance. The basic assumption was that the children attending the school for about 60 per cent of working days will acquire necessary knowledge, skills or competencies to make them pass at their own and they will not be declared promoted in the garb of non-detention policy having achieved very little competencies prescribed for them. The main reason for such a disturbing situation seems to lie in non-implementation of continuous periodic and comprehensive evaluation followed by diagnostic and remedial teaching. This problem can also be addressed and achievement levels increased if MLLs approach advocated above is sincerely implemented. This will help checking mis-interpretation of non-detention policy which most of the times has resulted into non-serious teaching in schools. While non-detention policy should continue, continuous and comprehensive evaluation must be implemented systematically so that children are helped to acquire the desired competencies for which necessary and timely remedial actions should be taken.

4.8 EXAMINATION REFORM AND MANAGEMENT OF EXTERNAL EXAMINATIONS

Indian system has been dominated by external examinations. Many efforts have been made to reform the same. Various experiments have been tried but with little success. The best evaluation can be done by none else than the person who teaches the students.

Experience tells us that the practising teachers have to bear lots of pressures and most of them succumb to pressures and therefore the faith and confidence in the evaluation by the teachers have got eroded. On the contrary the external examinations with their given ill-effects and inadequacies happened to be popular. The institutions of higher learning have been dependent on such external examinations to a great extent. But there has been a proliferation of entrance examinations by different bodies for admitting students to professional courses or recruiting personnels for different jobs. This shows that the credibility of external examinations has also gone down. The main reason for such situations seems to be excessive element of chance factor and subjectivity besides undue emphasis on memoraisation of facts.

The system of examination and evaluation needs to be thoroughly overhauled which requires great deal of determination and will for eliminating the vices of the system. The basic questions which arise in this connection are as under:

1. Should there be examinations/evaluation at all?
2. How much and upto which stage there should be school-based evaluation and at which stage public examinations should exist?
3. Could we think of a combination of both school-based and public examinations system?
4. Should there be grading or marks system? Which area suits most for grading system?
5. How to empower teachers to exercise constraint and to be judicious?
6. How to ensure reliability and validity in such evaluations?
7. How can semester system be introduced at +2 level?

The answers to aforesaid questions can certainly be found out but there is real danger in implementing them for which serious and concerted efforts would need to be made. The basic question of introducing transparency in evaluation at all levels of education will need to be resolved. Use of information technology could also be made to improve the management of evaluation system which has been a subject of criticism throughout. It needs to be borne in mine that we have to deal with large number of learners and examiners and as such there are chances that loopholes for malpractice can be invented which will also have to be anticipated and plugged. The earlier recommendation of decentralisation of boards to district level is worth considering. Care would need to be taken for better management and ensuring comparability through public examinations.

Since there exist the Boards of examinations with ever expanding wings in the country, these cannot be abandoned by a stroke of pen. It is not to say that they have lost their value and significance. Only it is the question of change in the roles. The Boards of examinations can do a great service if they come forward to help teachers in conducting school based evaluations by undertaking the role of trainers and developers of test materials.

There is need to have reliable and valid variety of test materials for achievement and diagnostic testing for each grade of school education. Energies of organisations like NCERT, SCERTs and Boards of School Education should be utilised in this venture.

There is great need for conducting National and Regional level Surveys of students achievements at different grades of school education which should be conducted by the agencies referred to above. These efforts can be undertaken at regular intervals of time in a cyclic manner.

Major emphasis should be given to deformalising the examination system as far as possible. Fear of examination and anxiety amongst students needs to be totally removed from the system. This can be achieved through effectively implementing the school based evaluation and reducing the public examinations in a phased manner. Evaluation should be such that students should like to get themselves assessed time and again so that they could plan their learning and become life long learners.

4.9 GRADING Vs MARKING SYSTEM

In India the whole system of assessment and evaluation is geared towards assigning of marks on 101 point scale which has its own merits and demerits. While it provides numerical description about achievement of learner on particular attributes it provides scope for multiple interpretation of the same. Undue comparisons with others turn the whole teaching learning exercise into the cut throat competition. Sometimes the anxiety levels are so increased that youngsters are found to resort to extreme steps.

In fact learners should be encouraged to achieve the best which they can. Meaning thereby the learners should compete in achievement with their own potential or the targets set for them in accordance with their potential by the teachers/system. This calls for a very systematic grooming of learners from the very early stages i.e. the system has to prove itself helping the learners rather than detracting them from education. An obvious implication of this points towards improvement in teacher training, availability of variety of tests, their friendly administration and appropriate guidance at all levels of education.

One of the alternatives to marking system in terms of percentages is grading. The Indian psyche is that the first thing that comes to mind is marks and than these are converted into grades which is contrary to the very spirit of grading system. While grading the learners the idea of marking in terms of percentages will need to be abandoned in early stages if for proper classification in terms of grades is to be achieved and the learners may be facilitated to learn more in the environment of cooperation rather than competition. Again this can be achieved through proper awareness, teacher training and systematic monitoring at the implementation stage.

In a recent development the CBSE has announced the scheme of assigning grades in place of marks at Class X examination which is a welcome development. The conversion of grades to marks as envisaged can be done in two ways:

a) Using percentile system which refers to norm referred approach and assume the attribute to be normally distributed. It may put examinees to undue advantage or loss if the distribution is positively or negatively skewed,

b) Certain ranges of marks may be associated with grades as achievement distributions are not always normal and tend to be skewed.

Now the issue that emerges that which of the above two be put to use.

Again providing marks for grades on demand will not allow this reform to take roots and the purpose may get defeated. At best the ranges as proposed in second alternative above may be published for use.

The school based evaluation in general and the non-scholastic one in particular should be attempted in terms of grades for which teachers should be properly oriented. The element of subjectivity may be reduced by employing multiple criteria and multiple sources from where the assessment should come. Proper criteria will need to be specified for oral and written test as per the nature of content/competency.

4.10 EDUCATIONAL TESTING SERVICE (ETS)

Establishment of Educational Testing Service (ETS) as per the recommendations of NPE, 1986 was considered as an important aspect of educational measurement and evaluation in the country. It could not come into existence although it was significantly mentioned in the *National Curriculum for Elementary and Secondary Education Framework* (1988). Given the situation with regard to the performance of learners, schools and boards of secondary education which have ever increasing problems and which are accepted for want of better option being available in the system. It is hightime that the need for establishing educational testing service is re-iterated. A suggestion was made in the NPE, 1986 that ETS should be technically assisting the school administration to compare the achievement levels of different institutions and to provide academic inputs to schools for introduction of more innovative internal assessment procedures by the schools on their initiative. The ETS could also help selection of learners for entry to educational/ professional institutions at various levels and for grading of learners wherever necessary. It could also help various employing agencies for assigning specific jobs for persons suitable for them. There is need for re-looking into the possibilities of establishing Educational Testing Service with properly delineated objectives and purposes.

Conclusions

The above descriptions may be summarised to state the following:

(i) Proper testing materials may be developed for each stage of learning and provided to the teachers for use.

(ii) National testing surveys may become a regular feature.

(iii) Continuous, periodical and comprehensive evaluation needs to be institutionalised.

(iv) Teacher education curricula need to be modified to make room for certain relevant suggestions.

(v) Orientation of teachers should lay emphasis on construction and use of evaluation devices.

(vi) Grading system may be introduced and school-based evaluation strengthened.

(vii) Public examinations may be phased out excepting at Class XII level.

(viii) Non-cognitive areas of learning should be given equal weightage.

(ix) Parental/community support may be sought and awareness built up.

(x) National Testing Service needs to be established.

Implementation and Managing the System

Chapter 5

A curriculum framework indicates a nation's policy decisions in the field of education and the directions in which the desired changes could be brought about in the educational system within a reasonable period of time. The impact of the framework on the educational scenario of the country and the total success of the educational endeavour hinge on a number of factors, first, the dynamic nature of the framework in responding to a wide variety of cross-cultural setting where it has to be given a concrete shape in the form of syllabi, teaching-learning materials, evaluation, etc., secondly, the strong politico-administrative will and insight that would facilitate effective implementation of the framework, and thirdly, a comprehensive understanding of the curriculum framework in letter and spirit among the translators, i.e., the teachers themselves.

The proposal for curriculum renewal as outlined in the present document, therefore, calls for multipronged activities involving different agencies. The major intervention programmes required for implementing the proposed curriculum would include:

- The acceptance of a common educational structure, i.e., 10+2+3 pattern of education all over the country. Although it was one of the basic objectives behind the previous framework, some states have not yet implemented it. Even though the common pattern of 10 years of general education has been, by and large, accepted by most of the states in the country, the situation relating to the +2 stage is quite different. The +2 stage in some states is part of the school system, yet in some others it is part of higher education and even in some states there is a separate Board for these two years of education.
- While several difficulties are pointed out by the states, there is a strong need to bring the +2 stage to the school and hence all such problems creating hurdle in this task should be solved on a priority basis. The concerned ministries at the governmental level will have to take the major initiative in this direction.
- Similarly, the uniform national acceptance and implementation of the two years' school readiness pre-school education programme may also be ensured. At present, only some states and mainly in the urban sector have early childhood education centres and the rural, underprivileged population for whom the programme is needed all the more, has no access to it in the desired form. Thus, all the young learners entering Class I today are not equally prepared for education and this generates inequity.
- Development, production and introduction of a new generation of instructional packages including textbooks and multimedia packages in

keeping with the policy decisions and approach of the new curriculum framework;

- An effective strategy for preparing teachers who have a very sound understanding of their subjects and possess a sound pedagogical base.
- Orientation of teachers, other educational functionaries and the community at large to the educational concerns, the new instructional packages and the recommended strategies of curriculum transaction.
- Strengthening of the technical support systems and development of professional capabilities at all levels for development of syllabi and instructional packages, and for the orientation of teachers and other educational personnel.
- Continuous monitoring of the implementation of curricular transaction through educational management at all levels.

Curriculum renewal is an ongoing process and the major initiatives required for success in this venture as visualised in the proposed framework have been elaborated under the following sections:

- Professional Support for Curriculum Development;
- Professional Support for Teacher Education System;
- Integration of Information and Communication Technologies into Schooling;
- Proposed Infrastructure and Management System for Implementation of Work Education and Vocational Education;
- Education for Value Development;
- Implementing Strategies for Children with Special Needs;
- Implementation of Evaluation Strategies;
- Guidance and Counselling;
- Institutional and Organisational Reforms and Instruments of Intervention.

5.1 PROFESSIONAL SUPPORT FOR CURRICULUM DEVELOPMENT

During the last couple of decades state educational authorities have taken several initiatives to help the curriculum development process on a continuing basis by setting up State Councils of Educational Research and Training (SCERTs), State Institutes of Education (SIEs), District Institutes of Educational Training (DIETs) and other similar bodies. At the national level the Central Board of Secondary Education (CBSE) and the Indian Council of School Education (ICSE) and in some states the Boards of Secondary Education have been playing an important role in designing syllabi for the secondary and the Senior/Higher Secondary levels. These bodies have some professional support for the venture, but they need to be further strengthened and activated for playing their role as potential sources of curriculum development more effectively. Similarly, State Textbook Boards were established in almost all the states for commissioning of authors, and preparation, production and distribution of textbooks. However, the multiplicity of the agencies involved in the curriculum development process created a major problem of coordination among them which necessitated proper and effective networking at the national and state levels. It is now very important that coordinated decentralised curricula, syllabi and instructional packages including textbooks and try-out materials be developed following the basic design of the national curriculum framework and accommodating the local needs and aspirations under the expert guidance of the NCERT, the SCERTs and the SIEs and active cooperation of the other national/state level agencies and prominent Non-Government Organisations (NGOs). Even empowerment of teachers as curriculum developers would be desirable.

5.1.1 Innovative Approaches in Instructional Material Preparation

A major change in the approach, planning, preparation, production and distribution of all the teaching-learning materials would be absolutely necessary for any significant improvement in curriculum transaction. Accordingly, materials needed for the education and enrichment of teachers and other resource persons would also have to be developed afresh. Instead of the present teacher-centred, content-oriented learning materials, we shall have to develop competency-based, process-oriented materials that would facilitate joyful self-learning and self-directed learning experiences in both the formal and the alternative education modes. Just one content-loaded textbook for each subject would not be helpful. There has to be a complete package of textbooks, workbooks, teachers' handbooks, and multimedia materials. The exercise of carrying out cosmetic changes here and there in our teaching/learning materials would be of little use, as a totally new generation of teaching/learning materials in keeping with our contemporary concerns, approaches and thinking alone can ensure improvement in our educational scenario and achievement of our national educational objectives.

There should also be some room for local level innovations and modifications in the details of curricular areas, particularly in the curriculum of primary schools in the rural sector and remote parts of the country. Although a project like the District Primary Education Project (DPEP) seems to have paid some attention to this need, adequately effective steps in this area will have to be taken.

5.1.2 Environment and Community as Resources for Curriculum

Environment, both rural and urban, and community are great resources for curriculum development. The vastness and openness of the serene rural environment with its fields, ponds, rivers, orchards, trees, birds and animals is a major provider to curriculum development. Similarly, the busy business centres, industrial complexes, neat and clean residential clusters and the not so clean and healthy slum areas of cities provide a different kind of input to the process of curriculum making. However, due to the inflexible nature of the instructional arrangements, procedures and prescribed materials the rural and urban slum area schools and their teachers generally fail to take advantage of the richness of their respective environments. Curricular materials and training and enrichment materials for the teachers prepared by the local educational institutions/authorities should take special note of the rich environment resources available in their respective areas. Community can also provide physical resources to school and alternative schooling centres through voluntary contributions and also by providing services of persons having special skills for curriculum transaction particularly relating to work education, art and culture, health and physical education, etc. in some form or the other.

5.1.3 Development of New Instructional Packages

Detailed curricular guidelines and model syllabi for all the stages of school education – primary, upper primary, secondary and higher/senior secondary – would be developed by the NCERT. The coverage in each subject area, its depth and treatment for each stage and grade should be indicated in the curricular guidelines keeping in view the learning outcomes to be attained by the learners. The scheme of studies should ensure equal importance to the scholastic as well as non-scholastic areas like work education, art education, health and physical education, core curriculum components and moral and spiritual values. This has to be followed by development, production and introduction of packages of curricular materials for Classes I to XII in a phased manner.

Exemplar instructional packages on several new and relatively unknown areas of knowledge should also be developed as a part of the front-line curricular materials. Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) of the NCERT has already developed several modules on work education/vocation-related activities in the areas of agriculture, commerce, home science, personal and public health and everyday uses of modern technology. However, more and more of such materials, both in print and video form, will have to be prepared at the national and state levels. Then these should be made available to all the states/UTs for adoption, adaptation or using them as models for development of their own packages relevant to their needs.

Modular instructional packages for introduction of instruction/activities in the area of common core components and value education should also be prepared by the NCERT. These should be made available to all the states/UTs for adoption, adaptation and for their translation into all the national languages so that these could be easily introduced as an integral part of all the stages of school curriculum. In addition to materials in the print form, audio-video programmes on themes related to common core components and values should also be developed and disseminated.

As stated earlier, parents, community in general and the managers of education are also powerful agents for effective curriculum transaction. So far their active participatory role and accountability have not been sufficiently emphasised in the system. Now it has become imperative that appropriate encapsulated orientation materials for these agents be developed and disseminated to ensure their maximum and effective involvement in the process of social regeneration through education. The important key ideas and issues should be put before them in an easily comprehensible form.

5.1.4 Strengthening of Research Base for Curriculum Development

Further strengthening of links between the available infrastructure of educational research and the agents of curriculum development and materials production is one of the imperatives today. The NCERT, the SCERTs, the SIEs and the university departments of education should encourage, sustain and carry out educational research and disseminate their research findings to feed and strengthen the curriculum development centres. For this their own research capabilities should be augmented. Besides, a number of Non-Governmental Organisations are involved in different educational projects and their experiences and research findings should also be available for the development of curriculum and curricular materials. A definite policy to promote curriculum research in the country by commissioning research should also be adopted. The NCERT has been doing it through its Educational Research and Innovations Committee (ERIC). The other national and state level organisations should also promote this activity.

5.2 PROFESSIONAL SUPPORT FOR TEACHER EDUCATION SYSTEM

The school education system has a symbiotic relationship with the teacher education system – one influencing the other. The role of teachers in the development as well as in the implementation process of curriculum is vital. It is important that all the changes and developments taking place in school curriculum should get regulated in the teacher education programmes. Some of the specific ways for doing so could be as follows.

5.2.1 Pre-service Teacher Preparation Programmes

The first important step that needs to be taken in this direction is by the National Council of Teacher Education (NCTE). It shall have a relook at the pre-service teacher preparation curriculum. Even though this curriculum has been revised recently, yet it becomes imperative to incorporate new concerns and issues in the teacher education curricula emerging from the school curriculum. A measure like this would reduce pressure on the inservice education of teachers at a later stage.

While revising the curriculum of teacher preparation programmes special care may have to be taken to include understandings and competencies relating to different elements of curriculum development such as how to empower teachers to become part of curriculum planning, research and evaluation processes. In the long run this shall help in having greater decentralisation of the curriculum development process. Pre-service student teachers both by way of their theoretical as well as practical training shall have to be initiated in the different processes of curriculum development.

The teacher education curriculum framework may necessitate giving greater emphasis to inclusion of content knowledge relating to different subject areas. Experiences have shown that the subject-matter knowledge of student teachers which they possessed prior to their entry into the professional courses is rather limited. Even the integration of methods of teaching with the content of teacher subjects may have to be ensured.

5.2.2 Inservice Training Programmes

The ultimate success of curriculum implementation depends on the classroom teachers. In order to facilitate them to do so, the inservice teachers need to be, in the first instance, sensitised about various new curricular concerns and issues. To do so, print materials may be developed in a simple, jargon-free language for teachers by agencies such as NCERT in collaboration with other agencies. Experiences in the past have shown that in absence of such materials there has been lot of confusion amongst teachers regarding various emerging and new concepts. These print materials may have to be developed in various regional languages and sent to the teachers well before they come to attend inservice teacher training programmes.

The print materials can be supported by audio-video films and filmstrips on different curricular concerns and issues.

During the interim period when the new syllabi and new generation textbooks based on the curriculum framework are being developed, the teachers can be provided large scale in-service training through direct and distance mode (also through teleconferencing). Like previous occasions a cascade model of training Key Resource Persons (KRPs) and Resource Persons (RPs) can be followed. A collaborative mechanism for this purpose may have to be evolved by agencies like NCTE, NCERT along with SCERTs and DIETs. It may however be added that this inservice training like previous occasions shall not be a one-time affair, but shall have to be on a sustained and regular basis.

Experiences have shown that it is not only the in-service training of the teachers which is important for implementing the curriculum, but it is equally important to orient different educational administrators at the state, district and block levels. Orientation and training of key functionaries like District Education Officers (DEOs), Block Education Officers (BEOs) in various issues of curriculum, therefore, becomes important. In this context it may also be stated that the training of Headmasters and Principals of the schools shall also have to be undertaken as they have to play the role of a facilitator in the implementation process.

5.2.3 Involving Elementary and Secondary Teacher Preparation Institutions

Curriculum implementation both at the national and state levels cannot be left to a handful of institutions. Involvement of all those institutions which have capacities to perform these functions needs to be tapped. During the past decade a good number of teacher preparation institutions both at the elementary as well as at the secondary levels have been either established or strengthened. A special mention may have to be made about moe than 400 District Institutes of Education and Training (DIETs), about 100 Colleges of Teacher Education (CTEs) and about 40 Institutes of Advanced Studies in Education (IASEs). While the DIETs have a specific Curriculum and Materials Development Department (CMD), the CTEs and IASEs by way of their function are required to provide training to the secondary teachers and elementary teacher educators. The training priorities of these institutions may have to be geared specifically to provide in-service training to the teachers in various new concerns and issues relating to curriculum and its transaction.

5.2.4 Resource Centres at the School Complex Level

With the establishment of resource support at the district level through DIETs, the resource support at the sub-district/school complex needs to be activated and strengthened. Support centres such as Block Resource Centres (BRCs) and Cluster Resource Centres (CRCs) established at many a places could become potential centres for interactions/meeting with teachers.

Resource centres placed at the central points of school complexes should provide both material and manpower resources for school improvement programmes. The centres can also be used for providing support to distance education systems. In addition to a good library and audio-video equipment, all materials developed for in-service education should be made available at the resource centres. Physical facilities for short stay of teachers at the resource centres also deserve consideration. Availability and continuous strengthening of these facilities would be a big step towards in-service education of teachers. In the absence of this support, the impact of the current (mainly face to face) in-service programmes can only be limited.

One of the policies should be to recognise all educational institutions known for providing better quality of education as potential resource centres, irrespective of their management characteristics. The strategy should be to draw upon the physical and human resource of these institutions for the in-service training of teachers and other personnel from neighbouring institutions. At present, there are a large number of smaller towns and semi-urban areas where only a few schools exist, which could be cited as resource schools in those areas. Therefore, the establishment of a substantial number of schools for providing quality education to the under-privileged population and also to act as lead institutions in the area should form a part of the strategy for school improvement.

5.2.5 Networking of Technical Support Structure for Teacher Education

As indicated in Diagram IV-a, at present several agencies such as National Institute of Educational Planning and Administration (NIEPA), Central Institute of English and Foreign Languages (CIEFL), Central Institute of Indian Languages (CIIL), Kendriya Hindi Sansthan (KHS), National Institute for the Handicapped (NIH), at the national level, Regional Institutes of English (RIEs) and Technical Teachers' Training Institutes (TTTIs) at the regional level, State Councils of Educational Research and Training (SCERTs), State Institutes of Education (SIEs) and Boards of Secondary Education, Departments of Education of the Universities, Colleges of Education at the state level, District Institutes of Education and Training (DIETs) and Centres of Continuing Education (CCEs) at the district level, are engaged in planning and extending inservice programmes. All India Radio and Doordarshan also extend some support to these programmes.

Different institutions and modalities for teacher education can coexist, but will be necessary for some institutions to take up the responsibility of planning and coordination. A national agency, supported by state level counterparts, may continuously identify the needs of in-service education, and recommend suitable modalities in designing teacher education programme.

The SCERT/SIE or any other institution may be the nodal institution in a state. It may be assisted by the district level agencies. It should involve teacher training institutions (university departments), general colleges, high school teachers and supervisory staff of the departments of education.

Strategies planned by agencies at the national, state or even district levels should meet the requirements of reorientation of teachers that arise out of changes in curricula. Such strategies cannot meet all the needs arising out of school situation, or a small group of individual teachers. These needs, however, cannot be underestimated. There should, therefore, be provision for less formalised, school-based inservice education of teachers as well.

Agencies associated with teacher education in the areas of their concern, would develop as national and regional curriculum development centres. In order that curriculum development work carried out at different institutions could be coordinated and utilised for mutual advantage at different levels, it would be imperative to establish some coordinating mechanism for dissemination of curriculum and teacher development strategies developed by the different centres.

This exercise will ultimately produce a network of institutions to provide professional support not only to curriculum development but also to teacher development. It needs hardly any emphasis that in a vast country like India there is an urgent need to have optimum benefits of the work being done by different agencies operating in different parts of the country. This strategy will accelerate improvement in different aspects of education.

5.2.6 Monitoring and Evaluation of Teacher Education Programmes

Finally, monitoring and evaluation of in-service education, like any other programme, should be a part of the total programme. Continued feedback on activities planned and undertaken, materials produced and extended, functioning of the agencies involved, and number of teachers oriented, should be utilised to correct, replan or redesign the modalities. Performance of the teachers also needs to be evaluated frequently.

5.3 INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES INTO SCHOOLING

An implementation strategy for large scale introduction of the information and communication technologies into schooling has to take into account several factors that are directly or indirectly linked to the process.

Some of these factors have been taken into account in the Information Technology Action Plan of the Government of India (1998). Making computers available to increasing number of schools is the very first measure that the Informaton Technology (IT) Action Plan proposes. Launching schemes for easy-instalment bank loans and other measures to help students, teachers and schools to buy computers is going to be a major support for the school community.

Setting up of a National Council for IT Education has also been recommended for developing IT courses for various levels of training of teachers.

IT-rich schools with substantial technological input have been the other recommendation. The Council has worked out a blueprint for Smart Schools which the MHRD proposes to establish all over the country albeit in limited numbers. Apart from working out a conceptual framework for these schools, the technological support and expenditure involved therein, the changing role of the teacher, nature of learning programmes, exemplar activities for students and skills expected of them in different grades and, finally, imperatives for teachers have been worked out in great details.

The most crucial factor in implementing and maintaining any innovation in the school is the teacher. There is an immediate need for course outlines and training manuals for in-service training of teachers in IT skills and appropriate pedagogy to use those skills in curriculum transaction. Short in-service courses for teachers have often been taken in the past as a basis for developing expertise in handling computers. To help teachers sustain the learning process into everyday school and classroom work, a school-centred approach to continuous training is a more useful proposition. This would maintain the learning process beyond the short course and into regular school and classroom life.

For pre-service courses, a core course on IT literacy and methodology courses for using IT as a tool, relevant for teaching-learning activities at various levels of schooling should now be designed immediately and teacher-educators may be supported for teaching the course.

There are a number of recognisable tasks ahead. They are:

- Standardisation of hardware and software for schools;
- Development of pre-service courses for IT-enriched education and their integration into the teacher education curriculum;
- Development of training modules and induction level training for in-service teachers;
- Development of guidelines for use of information technology and computer-based learning materials in the classroom at different grade levels;
- Development of assessment strategy for measuring student performance;
- Development and use of multimedia courseware based on school curricula;
- Development and continuous upgrade of navigational maps on the world-wide web for helping learners locate appropriate learning materials on the Internet.

5.4 INFRASTRUCTURE AND MANAGEMENT SYSTEM FOR IMPLEMENTATION OF WORK EDUCATION AND VOCATIONAL EDUCATION

A comprehensive management system for vocationalisation of education visualises various agencies at national, regional, state, district and institute levels, with well-defined functions for each of them. The broad functions earmarked are: (i) Policy and Coordination, (ii) R&D Evaluation and Monitoring, (iii) Administration and Implementation, and (iv) Examination and Certification. This system should liasion between various Ministries, Departments and Boards/Councils, grassroot level functionaries, agencies and organisations for proper utilisation of community resources, better vocational education and training, appropriate placement of the students and greater awareness about the vocational education programme among the masses. Such a system is being created through the Centrally Sponsored Scheme on

Vocationalisation of Secondary Education at various levels. A Joint Council of Vocational Education (JCVE) has been constituted to plan and coordinate the vocational programmes at the national level. The School Bureau of Department of Education in the Ministry of Human Resource Development is providing administrative and financial support to the programme.

The management system for vocationalisation of education should provide for effective functioning of the 'meaningful partnership' of the states and the Centre in implementing various programmes. In order to derive the best from the national level R&D support system, the states will have to build up greater capabilities which will meet the specific requirements concerning resource generation and utilisation, curricular material development, administration, supervision, monitoring, evaluation and training for proper implementation of the WE, PVE and VE programmes. The administrative linkages between various departments working at the national, state and district levels (Table 1) should be strengthened to promote and guide the establishment of a comprehensive management system for vocational education at different stages of education.

Table 1

Management Structure for Work Education, Pre-Vocational and Vocational Education

Functions/ Levels	*Policy and Coordination*	*R&D Evaluation and Monitoring*	*Administration and Implementation*	*Examination and Certification*
National	Joint Council of Vocational Education	PSS Central Institute of Vocational Education, Bhopal	Bureau of Vocational/School Education, MHRD	Central Board of Secondary Education/Indian Council of Secondary Education
Regional	—	Regional Institutes of Education	Regional Board of Apprenticeship Training	—
State	State Council of Vocational Education	SCERT/State Institute of Vocational Education/ State Institute of Education	State Department of Education	State Boards of Examination/ Higher Secondary Council
District	District Vocational Education Committee	District Vocational Training Centres/ District Institute of Education and Training	District Education/Vocational Education Officer	—
Institute	Institute Advisory Committee	—	Principal/Head Master of Institution	—

At the national level, the Research and Development support for Work Education, Pre-Vocational Education and Vocational Education is being essentially provided by the Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), set up in the NCERT which is functioning as a National Resource Centre. Its functions include orientation and training of key stakeholders from States/UTs in Work Education, Pre-Vocational and Vocational Education, development of guidelines and exemplar curricular and instructional materials and evaluation and monitoring. The PSSCIVE also functions as the technical wing of the MHRD on all matters related to vocationalisation at all stages of education.

Presently, in the absence of pre-service vocational teacher training programme, competent vocational teachers are often not available. The Regional Institutes of Education, NCERT and other Professional Institutions may introduce a well-structured programme of pre-service vocational teacher training in consultation with the National Council for Teacher Education and the PSSCIVE, NCERT.

There is no National Board of Examination for Vocational Education. However, the Central Board of Secondary Education (CBSE) and the Indian Council of Secondary Education are affiliating institutions and conducting examinations for vocational courses. In order to provide uniformity in curriculum transaction throughout the country, an Accreditation Board may be established within the PSSCIVE which ensures that all curricula developed by the states independently are in competency-based format and meet the objectives of competency standards essentially needed for a vocation.

5.4.1 At State Level

Actual implementation of the Work Education (WE), Pre-Vocational Education (PVE), Generic Vocational Course (GVC) and Vocational Education (VE) Programme is the responsibility of States. Therefore, they should take concrete steps to provide an effective management and monitoring system at the state and district levels. It would be desirable if a separate Directorate of Vocational Education is established for planning, implementation, supervision and monitoring of WE, PVE, VE and GVC programmes.

Till the State Governments establish a separate Directorate, a state-based resource group may be created in the Directorate of Education/SCERT for Work Education and Pre-Vocational Education which will have interaction with the PSSCIVE to make use of the R&D support system. The resource group may include experts from other institutions as well as from the WE or VE cells/units already existing in the Directorate. It should essentially work for development of curricular materials and training and evaluation for WE and PVE. Similar steps may be taken for +2 vocational programme. The States may constitute State Council of Vocational Education (SCVE) to take policy decisions regarding implementation of vocational education programme. Research and development support may be provided by a cell in the SCERT or the State Institute of Vocational Education (SIVE). SIVE should work for development of curricular and instructional materials and training of various stakeholders.

The basic requirement for proper selection of vocational courses in any district or region is to identify the employment potential in it and assess the relevance of courses to the developmental activities of the region. District vocational surveys have to be conducted to indicate the employment opportunities available in the region and also the quality of manpower required along with the types and standards of skills needed for various occupations. The survey should be conducted periodically by SCERT/SIVE or Directorate.

The State Boards of Examination develop curricula for Pre-Vocational/ Vocational Courses and conduct the examinations. Some boards have adopted/ adapted the curricula developed by the PSSCIVE.

The Generic Vocational Course has been introduced at +2 stage in some schools of the Central Board of Secondary Education (CBSE) and Kendriya Vidyalaya Sangathan (KVS) on an experimental basis. The course may be introduced in all the schools of the country and suitable arrangements may be made for conducting the examinations by the State Boards of Examination/ Higher Secondary Council.

5.4.2 At District Level

District Education Officer (DEO) or District Vocational Education Officer (DVEO) will supervise and oversee the implementation of WE, PVE and VE and shall work as the nodal agent for organising and coordinating various activities at the District level. The DVEO should constitute a District Vocational Education Committee, with District Magistrate as the Chairperson for considering matters related to implementation and coordination of activities.

The District Institute of Education and Training (DIETs) and Colleges of Teacher Education (CTE) should provide in-service training programmes of different durations to WE and VE teachers at various stages of education. These institutions should use community resources for training and curriculum transactions. District level planning will have to be more relevantly done by the DIET and CTEs taking cognizance of local conditions, needs and facilities for WE and VE.

In order to bring about qualitative changes in the implementation of VEP at the +2 level, there is a need to ensure the availability of infrastructural facilities and an effective management system. The VEP could be made effective through the establishment of strong and effective linkages between the institution and the industry/small enterprises. It should be on partnership basis with a common goal for developing human resource, right from the planning stage to employment stage. The DVEO is expected to play a pivotal role in establishing and coordinating the linkages between the school and industry.

5.4.3 At Institutional Level

At the institutional level, Institute Advisory Committee (IAC) may be formed in each school, headed by the Principal/Headmaster. It should have WE teachers/Vocational teachers/Craft teachers and representatives from parents-teachers association, community, local industry and students as its members. The committee should help in the actual implementation of WE, PVE, and VE programmes regarding resource mobilisation, working out annual plan, identification of work situations, organisation of activities, motivation to students, parents and community, etc.

The pre-vocational courses should be started in such institutions where vocational stream has already been introduced at the +2 level. The infrastructural facilities available for vocational courses at the +2 level should be utilised for pre-vocational courses also. Use of specially designed models of real-world equipments such as solar-powered equipments, windmills, health and safety equipments, etc. and computer simulations may be introduced in schools to enhance children's creativity and scientific temper.

Considering that there are resource constraints for education in general and for vocationalisation in particular, the time has come when institutions have to increasingly consider the possibilities of generating resources from their own efforts. Thus, there is a need for adoption of production-cum-training-cum-services modality in learning and earning through 'hands-on' experiences at the institutional level. Entrepreneurship development becomes a major objective of this modality. The establishment of Production-cum-Training Centres (PTCs) in schools should operate through the Institute Advisory Committee. Cooperation and coordination of different institutions running PTC is essentially required for exchange of experience and other services to achieve the objectives of the programme.

Vocational guidance and counselling services have an important role to play at all levels of WE, PVE and VE programmes. Provision of timely and relevant information on education, training and work opportunities and related placement and follow-up activities is important for successful implementation of vocational education programmes. Vocational guidance and counselling is important in directing the individual's career through his/her interests, talents and abilities. Efforts should, therefore, be made to provide a visiting trained school counsellor for a cluster of three to four secondary schools in a planned manner. In addition to the fully trained counsellors, a vocational teacher in each secondary school should be trained in guidance and counselling. Facilities for training in guidance and counselling should also be augmented. The existing State Bureaus of Educational Guidance should take the responsibility of training teachers in consultation with the NCERT for their respective states.

5.5 EDUCATION FOR VALUE DEVELOPMENT

5.5.1 Policies of the School

Curriculum is an expression of the school philosophy, therefore, it may contain components that communicate essential values relating to physical environment, organisational health, human relations, such as discipline, cleanliness, punctuality, democratic functioning/commitment, responsibility for maintaining order, decorum, environment protection, respect for others' religion, caste, creed and community.

These may be attained by stating clearly the school goals, evolving discipline through participation of staff and students, wherever necessary, ensuring two-way communication for redressal, welfare services, providing freeship and help to needy students, remediation, re-evaluation and non-rejection of poor-achievers, rules ensuring participation of each student in the games, activities and programmes relevant to their interest.

5.5.2 Teaching-Learning Process

The total approach to teaching-learning may be geared to:

- highlighting the values inherent in the different subject areas
- providing children with opportunities for questioning, sharing, and respecting each other
- providing opportunities of learning democratic principles in the classroom transactions
- learning of equality of gender, social caste, class and religions
- learning of human rights particularly children's rights, environmental protection and healthy living, etc.
- the classroom atmosphere itself needs to be made tension-free and democratic to enhance values.

The teaching process may involve use of discussions, displays, exhibitions, value clarification/exercises, open sessions, teaching of the content, etc. for ensuring the development of values. Even the counsellors/physical education teachers/special teachers may be used for value inculcation.

5.5.3 Textbooks and Supplementary Reading

There are lot of universal human values inherent in the various subject areas which could be inculcated through the textbooks. The textbook content has to be developed in such a manner that these values get represented in an explicit manner and not remain as hidden agenda. The textbooks, therefore, have to be written carefully and also reviewed frequently to assess what values they are communicating. For instance, the textbooks in history and civics may communicate to students the diversity of culture, tradition and democratic functioning, etc. Language texts may communicate the values relating to politeness, universal brotherhood. Similarly, other subjects also have implications which may be spelled out in syllabi.

Supplementary reading material may also be used for developing human and universal values. Reading material may not be direct but in the form of stories, parables and biographies drawn from a variety of cultural and religious traditions.

Teacher Training should focus on:

- Developing teachers' communication skills,
- Clarifying their role in value orientation,
- Orienting them to identify the potential of different subjects and situations in school for fostering universal human value and sensitising teachers about their own influence as role models,
- Helping them to look at their own bias and attitudes on children.

Co-curricular Activities

Co-curricular activities are another very potent medium to communicate values. These activities involve NCC, NSS, Scouts and Guides, Games, Plays/Drama, Exhibition, Bal Melas, etc. The way values could get reflected through them is described below:

- Games communicate values of self-discipline, order, regularity, punctuality, living together, honesty, sharing, cooperation; and healthy competitiveness.
- Plays/Drama could also inculcate values by expressing sentiments relevant for cross-cultural tolerance, truthfulness, etc. using appropriate themes.
- Exhibitions, Bal Melas, displays, etc. may be used to convey the messages regarding universal human values. There may be value-based themes for these exhibition so as to encourage enterprise, creativity, concern for others, cultural heritage of India, etc.
- More inter-state cultural exchange programmes such as National Integration Camps may be instituted on the lines of NCC and NSS camping, etc. for cross-cultural understanding and peace.
- Lectures, Community Singing programmes, demonstrations by cultural/theatre/craft/creative groups may be used for value orientation.
- Celebration of religious festivals, and events of national importance also has implications for a host of values cherished by Indian Constitution, such as those of social cohesion and national integration.

Guidance and Counselling

The philosophy of guidance and counselling involves developing among students open-mindedness, sensitivity, caring, empathy, problem-solving skills, etc. Each one of these has implication for learning of values cherished by the Constitution and for Universal Brotherhood. The personality of the counsellor, the activities, and the processes of guidance and counselling are directed at inculcating these values among, not only students but also the teachers, parents and community. Large groups could be reached through group-oriented strategies.

5.6 IMPLEMENTING STRATEGIES FOR SPECIAL NEEDS CHILDREN

The current thinking about the education of children indicates that segregation or isolation is neither good for children with disabilities nor for children without disabilities. The societal requirement demands that children with disabilities should be educated along with other children in inclusive schools.

Inclusive schools are not only cost-effective but also have sound pedagogical practices. It has the potential to influence the quality schooling in a positive direction. The process of mainstreaming a child in inclusive school starts with the assessment of his/her educational need and preparation of an Individual Education Plan (IEP) in consultation with parents. Learning then is focussed on the individual child or it becomes learner-centred. The groups learning or cooperative learning as also peer-tutoring are encouraged in an inclusive school and this helps in mainstreaming of children with disabilities as also creating positive attitude among the non-disabled children.

In order to actualise the above, it would require definite action at the level of teachers, curriculum specialists and other people involved in the schooling process. Some of the concrete measures could be as follows:

1. Sensitising the teacher, by way of in-service programmes, to the needs of the children with disabilities;
2. Making appropriate modifications in the content so as to incorporate in each chapter for conceptual clarity at the level of children with different special needs;
3. Developing supplementary instructional material for children with special needs;
4. Developing guidelines for teachers for defining goals for all children in the classroom;
5. Preparing teachers and developing skills/competencies and strategies required to cater to the diversity in an inclusive setting;
6. Developing/working out evaluation procedures based on the factual information for children with different special needs;
7. Mobilising community resources to provide support to children with special needs like establishing resource centres.

5.7 IMPLEMENTATION OF EVALUATION STRATEGIES

Evaluation plays an important role in the total reform package for education. It provides reliable and concrete evidence of attainment of learners in both cognitive and non-cognitive areas of learning. The nature of feedback received from such evaluations depends mainly on two things:

- The type of testing procedures employed; and
- The nature of feedback derived for undertaking suitable action for further improvements.

If it is followed regularly in the system the quality of education can be improved on a continuous basis. It is a fact that it has not happened in the past and we have been moving on a beaten track. Although there have been systematic guidelines in the two earlier curriculum frameworks (1975 and 1988), the spirit of suggestions has not been reflected in the later developments. The main problem arises with the implementation where neither the pre-requisites are met nor the suggestions are followed. It seems that the focus on the child has got lost in the haste of following evaluation rituals as a matter of compliance. This has obstructed the growth of system of education and helped in erosion of faith about such reforms.

There have been suggestions in the previous curriculum documents with regard to the continuous and comprehensive evaluation, semesterisation at the +2 stage and establishment of National Testing Service. These were thought to be important landmark developments in the field of educational evaluation which could not become a reality. Major hurdles in this regard could be on account of proper training of the personnel, non-availability of materials, absence of follow-up mechanism, inertia to change their roles by the Boards of Secondary Education and above all lack of will to implement the suggestions in right earnest. These problems need to be tackled on priority basis if the goals envisaged in the present curriculum framework are to be realised. Keeping all these considerations and development in the recent past in view, the following mechanism is suggested for implementation of evaluation strategies.

5.7.1 Development of Evaluation Materials

A variety of evaluation materials may be developed by the organisations like NCERT, SCERTs and DIETs for the use of teachers, teacher-educators and parents; major items are mentioned below:

(a) With a view to avoiding communication gap, some brochures need to be developed on certain new concepts/strategies recommended for school education and be disseminated to all teachers and educational functionaries in the regional languages along with English. The major concepts may include continuous and comprehensive evaluation, using tests as feedback devices for qualitative improvement, interpreting and reporting test results, assessment of non-cognitive development in various aspects including values, maintaining cumulative records, oral testing, observations, etc.

(b) Achievement tests in all curricular areas from Classes I to XII need to be developed which could be used for ascertaining regional/national attainment levels of learners. These may also be used to improve the quality of institutions as their outcomes may act as good indicators of quality of schools. The same agencies which construct these tests may undertake programmes for assessing the learners' achievement at regular intervals of time so that inputs could be derived for educational policy making and research.

(c) Material needs to be developed for the consumption of teachers as to how to assess the participation of learners in co-curricular activities and the other non-scholastic qualities. Necessary proforma for recording of observations and assessments of learners need to be developed and provided to the teachers. Mechanism for interpreting and communicating these may also be developed and disseminated.

(d) Since evaluation is to be conducted by teachers in schools and, therefore, proper grooming of teachers through pre-service and in-service educaiton is essential. Materials will, therefore, be required for training of teachers in development of test materials, use of test materials, and deriving feedback for improvement of learners involving diagnostic and remedial teaching on the one hand and arranging the enrichment programmes on the other. These materials should be used for sensitisation of teachers about evaluation issues, practising evaluation and properly utilising the results of evaluation. Various proformae for tabulating the results of evaluation to be used in the context of continuous and comprehensive evaluation should also be developed and provided to the teachers before the follow-up exercises are undertaken. Teacher educaiton materials may also be modified accordingly.

(e) There is need to make parents and community aware of the procedures of evaluation being used by school and boards and how do they help improving the attainment of learners. Such materials may be developed and disseminated to parents and the community and the ideas could be shared in the meetings of teachers with them. Participatory monitoring and evaluation may be encouraged with regard to school programmes. This will help generate a cooperative environment and acceptability of the testing procedures in the society.

5.7.2 Role of the Boards of Secondary Education

The Boards of Secondary Education have engaged themselves in conducting public examinations as a major activity of their charter. As the name suggests these are the Boards of Education and not the Boards of Examination and, therefore, their activities should go beyond conducting of public examinations. It has been suggested in the previous curriculum frameworks that as the internal assessment system (school-based evaluation) takes roots, the external public examinations at the end of Class X should be abolished. The recommendation needs reiteration so that the Boards evolve a phased programme of accomplishing this. Another recommendation which needs reiteration is that of implementing letter grades, i.e. A,B,C,D,E for providing the assessment of learners' progress in scholastic and non-scholastic areas. No aggregate should be indicated. Thus there should be no pass or fail in the final school leaving certificate and the student should have opportunities for improving their grades in individual subjects.

The Boards of Secondary Education may gradually shift their focus from merely conducting the examinations to upgrading the quality of school education and strengthening school-based evaluation. The CBSE and the academic wings of Boards of Secondary Education may undertake responsibilities of orienting teachers on various modes of evaluation, deriving feedback and implementing diagnostic and remedial teaching and the enrichment programmes. They should have to develop suitable instructional materials and training strategies in this regard. The Boards need to decentralise their functioning if these goals are to be achieved. In fact the Boards should act as facilitator of evaluation exercises besides monitoring them for the larger good of the community. The Boards may have due linkages with agencies such as NCERT, SCERTs and DIETs. The extreme idea of abolition of Boards would then become redundant.

The Boards have their unique contribution to make towards semesterisation at the +2 stage. They may attempt awareness generation among teachers and community, development of necessary testing material, orientation of teachers in developing of implementation strategies.

5.7.3 Monitoring and Coordination of Evaluation Exercises

As has been stated earlier, teacher is the best judge of the students' progress. No external agency can replace the teachers, howsoever meticulous that might be. The external/public examinations which we are continuing has the legacy of colonial rule as dominated the total scene of evaluation undermining the importance of school-based evaluation. It is also a fact that there have been problems in the school-based evaluation as it has never been practised in a true sense. Need for coordinating and monitoring mechanism to make school-based evaluation a success cannot be under-estimated. Serious concerted efforts will have to be made in this direction. Some suggestions are made as under.

Pre-School Stage

The evaluation at pre-school stage has to be totally informal, flexible, and children-friendly. The targets of achievement in terms of various developmental aspects should be set beforehand. The progress of children on various aspects should be recorded periodically in terms of grades. Suitable experiences must be provided to make good the discrepancies between the performance and the targets of development. No effort should be made to introduce literacy and numeracy skills. Emphasis should be laid on socialisation of the child oral expression, motor development and development of aesthetic sense, creativity and humour. Teachers concerned should observe the children working/playing individually and in groups. Teachers should consult each other periodically when such assessments about children are made. The main purpose of evaluation would, therefore, be wholesome development of children along with readiness to learn.

Elementary Stage

Evaluation of children's progress from Class I to VIII should be systematically organised within the school and the headmaster should coordinate the activity. Teachers should be trained in keen observation of children while at work or play and should be able to record judiciously. These observations must be shared with the headmaster before being communicated to the children and their parents. Support may also be drawn from the society in finding solution to the problems of children which hamper their progress in school. Children's profiles should be developed and utilised for further improvement of the quality of learning.

Block Resource Centres and Cluster Resource Centres should be established and energised to support school-based assessment up to elementary stage. DIETs may coordinate the activity at the district level by helping the personnel at the level of BRCs and CRCs. Due emphasis should be given to organisation of diagnostic and remedial teaching from the initial stages. To make it effective, teachers should be sensitised about its need and relevance and be provided with necessary training and support. Children should be motivated to move towards mastery learning, self-learning styles and acquiring necessary social skills and values along with academic achievement. Oral and practical skills should also be given due emphasis. Development of desirable habits, skills, attitudes and values along with specified competencies in curricular areas should be ensured.

Secondary Stage

From Class IX onwards disciplinary approach of teaching can come into force. The system of continuous and comprehensive evaluation needs to be extended to secondary classes. Here the idea of school complex may be put to practice. Boards of Secondary Education and Directorates of Education may provide necessary support to the teachers and headmasters in evaluating the children's progress and evolving cumulative record-cards. These agencies may interact with the school complexes (the resource centres) through their district level functionaries. The corrected answer books should be shown to the students, discussed with them to make them aware of the mistakes committed by them and showing them how could they do better. Chances for improving performance/achievement must be provided. There should be subject-wise committee of teachers for each class to review the cases of discrepancies and to sort out difference in a convincing logical manner. Non-scholastic aspects should be assessed on a regular basis for which ample opportunities should be provided to the learners to exhibit their best. The public examination system should be abolished in due course of time. Emphasis should be laid on acquiring competencies, developing critical thinking, creativity and evaluative judgement. Rote memorisation/cramming should be discouraged at all costs.

Higher/Senior Secondary Stage

Senior Secondary stage is characterised by diversification of studies. The students prepare themselves for higher education/professional education and ultimately for life. Vocational education also finds a place at this stage. The semesterisation of the scheme of studies as advocated in the earlier document needs to be operationalised at the earliest. The Boards of Secondary Education have to play an important role in this direction. Needless to mention that the organisations like NCERT, SCERTs, and Departments of Education in the states will have to work in a cohesive manner to bring about this educational reform.

5.7.4 Impelementing Semestrisation

Despite +2 stage being accepted by many boards, the semesterisation, the assessment and testing, as suggested in the earlier document of 1988 has not been implemented anywhere. The whole idea of providing flexibility and dynamism in the curriculum is defeated, if the suggestions/recommendations are not implemented. Several suggestions were made with regard to the semesterisation earlier, and they are reaffirmed because any change in teaching-learning can take place only when there are implemented seriously.

- Semestrisation could be introduced in a phased manner as follows:
- To plan curriculum under each area of study in self-contained four broad themes. While respecting the logic, structure and spirit of the discipline there is ample scope to give a functional slant to these courses by making them problem oriented. This could go a long way in establishing relationship between theoretical knowledge on one hand and day-to-day problems on the other. This would enliven the process of education by enabling the students to participate in discussions and allied field work. Each theme should be good enough to be covered in one semester.
- To divide each semester course in units which would be problem oriented or thematic in nature. They should provide ample scope for interactive and participatory technique and enable students to learn on their own not only

from books alone but from what goes on around them in everyday life. Students will have to be given more opportunities to learn in groups, share their findings with others and in the process cover larger ground than what is possible when they study everything individually.

- To work out the details concerning certification requirements and modalities of assessment to be conducted at the end of each semester.
- To decide the norms for credit accumulation. The teaching of a subject for one period per week during the whole semester may be allotted a credit of one point.

5.7.5 Establishing of National Testing Service

There was a major recommendation in the *National Curriculum Framework* 1988 to establish National Testing Service which could not materialise uptil now. There is need to take necessary steps to establish National Testing Service at the earliest. It can begin operating from the NCERT before it gets fully operationalised. It may have its regional outfits to be established in the Regional Institute of Education in the beginning. District level counterparts of Educational Testing Service may be located in the DIETs. The National Testing Service may have the twin objectives of conducting national/regional/district level surveys of educational attainment and assisting various professional institutions in conducting the entrance examinations for professional courses and also assisting employing agencies in recruiting their employees.

5.7.6 Research Base for Evaluation

Various educational reforms do not find a place in the system if they are not research-based. This is true with evaluation as well. Serious and systematic research has to be undertaken at the level of NCERT, SCERTs and Boards of Secondary Education so as to answer various evaluation issues faced by the system. Teachers may also be encouraged to undertake action researches. Besides that some researches may be commissioned by national/state level organisations.

The aforesaid sections have suggested some points for implementation with a view to revamping the evaluation system in the country. The list is certainly not exhaustive. Other suggestions may be brought in by the agencies responsible for implementing the schemes in accordance with the new curriculum framework. It is to be noted that some problems arise because of the fact that 10+2 system has not been uniformly adopted by the states which may be emphasised once again. The pass percentage has been accepted around 33 per cent and even then the Boards results are not much encouraging. It is hoped that if the continuous and comprehensive evaluation is institutionalised and diagnostic and remedial teaching is done at the right time, the levels of achievement can be raised and we may be in a position to raise the percentage of successful students even higher than 33 per cent. As the reforms gain momentum, the minimum pass percentage can also be raised in a gradual manner.

Evaluation should not be considered as an isolated activity but as an important integral part of teaching-learning. The outcomes of evaluation should be utilised to obtain feedback for learners, parents, teachers and the system as a whole. Evaluation should lead to some action on the part of each one of them. Evaluation has to be free, frank and unbiased. The wrong practices which have gone deep into the system will have to be eradicated. This is certainly a difficult task but can be resolved by involving the administration, academics, teachers and the community.

5.8 GUIDANCE AND COUNSELLING

Diversification in terms of streams and sub-streams offers a wide range of options for students at the higher secondary stage. Likewise semester-length self-contained courses further add to the range and variety of choices open to a student. This calls for effective counselling and guidance services for the benefit of the adolescent. Every student is to be helped to select streams, substreams, courses and units in such a way that they conform to his/her psychological needs, attitudes, abilities and aptitudes. To discharge this duty, the school shall have to provide specialised guidance and counselling services to the students at this crucial stage of education.

Till such time as we may be able to provide a qualified counsellor in each higher secondary school it is desirable to provide one visiting school counsellor for a cluster of three to four secondary/higher secondary schools. In course of time a career teacher for each secondary school will have to be provided.

A guidance cell needs to be set up in the SCERT to provide technical support to schools. Its functions would be two fold, namely, development of materials and provision of training facilities.

The minimum that a school can do right now is to familiarise its teachers in preparing students profiles in terms of their personality traits, interests and capabilities on the basis of school record of internal assessment and semester course grades. They should also be familiar with employment opportunities available for different vocational courses provided in the school.

5.9 INSTITUTIONAL AND ORGANISATIONAL REFORMS AND INSTRUMENT OF INTERVENTION

Implementation and sustenance of educational reforms in India like any other developing country depends primarily on (i) the availability of the financial, human and material resources; and (ii) the appropriateness and the adequacy of the mechanisms for supervising, monitoring and evaluating changes. Suitable strategies may be designed for taking care of both the aspects.

5.9.1 Networking of Institution/Organisation

For bringing qualitative improvement in school education, stronger intra- and inter-sectoral links need to be established among the institution and organisations responsible for the Human Resource Development at different levels – nation, state, district and local (village/city). A mechanism needs to be evolved for the smooth and effective functioning of the education system through this network. Delegation of responsibilities with accountability at all levels and setting clear-cut goals may help in minimising beaurocratic procedures. It would however mean training and orientation of the personnel involved in this process at all levels for clarity in ideas and action.

Task-forces may be set up at the state, district and local levels having co-ordination among themselves with regard to their objectives and working modalities. These task-forces may comprise the representatives of the government, the schools and the community having some autonomy with regard to their functioning. Though they may have a fixed tenure of 3 to 5 years, there should be some continuity in the formation of the groups so that at a given point of time all members are not replaced simultaneously.

These task-forces should be responsible for (i) identifying/assessing the basic infrastructural needs of the schools in the area in a periodic manner; (ii) making plans and strategies for augmenting the essential resources both physical and human as well as optimum utilisation of the resource both for equity and quality, e.g. sharing resource available in the community such as using local libraries, and collecting and distributing used textbooks and reading materials for those who cannot buy them on their own, and procuring voluntary contribution from the community – money and professional service; (iii) suggesting suitable intervention strategies for handling problems of special nature; (iv) supervising and monitoring the implementation process; (v) evaluating the changes and reformulating strategies, if required in view of the experiences gained; and (vi) acting as an interface between the government and the community.

5.9.2 Provision of the Minimum Essential Facilities

The government at the central and the state levels should make adequate provisions for providing minimum essential facilities required for effective transaction of the curriculum in all schools/non-formal learning centres. At present there is a serious move to allocte at least 6% of the GDP to education sector in the country. The needs of the children with disabilities as well as other challenged groups should be kept in view for including them in the mainstreams. It is essential to ensure that all schools have basic inputs for teaching-learning, i.e. school building with classrooms, drinking water and toilet facilities, teachers, instructional materials and teaching aids. In this task, specific and time-bound strategies should be worked out with the help of all the stakeholders in the community for resolving critical and perpetual problems, e.g., inadequate number of sanctioned posts, delay in filling up of the sanctioned posts, engaging teachers in other governmental duties causing time loss in teaching hours, non-adherence to a minimum number of school days and lack of funds for the purchase and maintenance of certain basic teaching materials. The government alone may not be able to provide all that is required by schools and hence we may have to look for partnership in improving the school environment for enhancing quality of education.

Growing numbers of private schools have increased the disparity between the facilities enjoyed by different sets of schools – government and private. Serious thinking is required to generate resources for the augmentation of facilities in the government schools in general and those located in rural areas in particular.

Common scheme of studies in principle has been agreed upon but in practice several areas are being neglected in many schools. The reason being given is non-availability of essential facilities for these courses, e.g., lack of laboratories, subject rooms, equipments, instruments, and basic reference materials. Transaction of the curriculum in many areas such as science, social science especially geography, language and art education, suffers on this account. As a result, an unwritten diversification of courses takes place. Resource support is, therefore, necessary not only for quality but for equity as well.

The local educational authorities need to ensure the threshold facilities and arrangements required for teaching of all subjects with due emphasis under the common scheme of studies upto the secondary stage. Recruitment of trained subject teachers rather than generalists from the first year of the upper primary stage should be followed strictly.

At the higher secondary stage, keeping in view the requirements of the academic and vocational streams of education, necessary provisions should be made. Library, laboratory, workshops, playground, assembly hall, certain subject rooms, adequate number of classrooms, equipments and instruments must be given to all the schools. Over and above, trained qualified and competent subject teachers should be recruited for effective teaching-learning. It is a crucial stage as it provides step for higher learning. Mechanisms should be devised in consultation with the community (including professionals) to extend inter-sectoral cooperation in augmenting the resources of the schools.

Annexure I

Consultation Meetings with the Faculty of National Council of Educational Research and Training

1.	Department of Pre-School and Elementary Education	12 October 1999
2.	Department of Education in Science and Mathematics and Department of Computer Education and Technological Aids	13 October 1999
3.	Department of Education in Social Sciences and Humanities	14 October 1999
4.	Department of Educational Measurement and Evaluation and Department of Educational Surveys and Data Processing and District Primary Education Project Core Resource Group	14 October 1999
5.	Department of Educational Psychology and Foundations of Education	15 October 1999
6.	Department of Education in Non-Formal and Alternative Studies and Department of Education of Groups with Special Needs	15 October 1999
7.	Department of Teacher Education and Extension and International Relations Division	15 October 1999

8.	Central Institute of Educational Technology	18 October 1999
9.	Regional Institute of Education, Mysore	20-21 October 1999
10.	Regional Institute of Education, Bhopal	21 October 1999
11.	Pandit Sunderlal Sharma Central Institute of Vocational Education Bhopal	22 October 1999
12.	Department of Women's Studies	23 October 1999
13.	Regional Institute of Education, Ajmer	25-26 October 1999
14.	Regional Institute of Education Bhubaneswar	25-26 October 1999
15.	Department of Educational Research and Policy Perspectives and Planning, Programming, Monitoring and Evaluation Division	2 November 1999

Annexure II

Presentations by Eminent Educationists

1.	Prof. M. Mukhopadhyay Senior Fellow National Institute of Educational Planning and Administration (NIEPA) New Delhi 110 016	12 November 1999
2.	Prof. J.N. Kapur Professor Emeritus Jawaharlal Nehru University (JNU) New Delhi 110 067	15 November 1999
3.	Dr Arvind Kumar Director Homi Bhabha Centre for Science Education Mumbai 400 088	19 November 1999
4.	Shri M. Varadarajan Member National Minorities Commission New Delhi 110 001	22 November 1999
5.	Dr Sugata Mitra Vice President NIIT – CRCS Hauz Khas New Delhi 110 016	24 November 1999
6.	Prof. Ravindra Kumar Jawaharlal Nehru Memorial Fund Teen Murti House New Delhi 110 001	25 November 1999
7.	Prof. Yogendra Singh Professor Emeritus Jawaharlal Nehru University New Delhi 110 067	26 November 1999

8. Dr Kapila Vatsyayan Academic Director Indira Gandhi National Centre for the Arts Janpath New Delhi 110 001	29 November 1999
9. Prof. R.H. Dave Former Director Unesco Institute of Education Hamburg (Germany)	14 & 15 December 1999
10. Prof. Yashpal Former Chairman University Grants Commission New Delhi 110 002	24 December 1999
11. Dr S.Z. Qasim Vice Chairman Society for Indian Ocean Studies Secular House New Delhi 110 016	28 December 1999

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